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CHINA VERSUS JAPAN.

To those unfamiliar with the national histories of "China" and "Japan," and the peculiarities of their peoples, the present war between these two nations, with the results thus far accomplished, is a source of profound astonishment.

That an empire with a population numbering less than thirty-five millions could invade a neighbor's territory whose population numbers four hundred millions, and in a brief period of time defeat them in every engagement, capture their strongholds, march to their capital, and dictate terms of peace, is a surprise even to those who are best acquainted with the history of the two nations. The Chinese navy has fared no better. It has been captured or destroyed,—in short, completely demoralized beyond redemption, at least, for the present. And all this accomplished by a power so infinitely less in numerical strength as to suggest a theatrical military farce rather than a war in sad reality, so far as China is concerned.

As to the causes leading to the defeat and humiliation of the Chinese army and navy there will be a variety of opinions. I venture to suggest the following:

First. The Chinaman's lack of national patriotism; his interest seems to be circumscribed by the boundaries of the province in which he resides. Such a thing as a voluntary sacrifice of property or life for the national good never enters his mind or governs his actions.

Secondly. To the average Chinaman military affairs are distasteful, his highest ambition being to excel in his examination for high

civil positions in affairs of state, to be able to observe all the forms and ceremonies handed down by hundreds of years of tradition; what rites he shall observe on the occasion of an eclipse of the "sun" or "moon"; the special forms he must observe to preserve these planets from the attack of the dragons, etc.

Finally. In their stolid conservatism, assumption of supremacy, and self-sufficiency. It is impossible to convince them that they are not the chosen people of the earth, and all the rest of mankind barbarians from whom they can learn nothing. They will not profit from experience or observation, hence must pay the penalty. A "Grant," a "Napoleon," or a "Wellington" could never construct an efficient soldier upon European or American standards from such material.

From the preface of a late work ("Society in China") written by Robert K. Douglas,[1] of London, the following extracts are taken: "There is no country in the world where practice and profession are more widely separated than in China. The empire is pre-eminently one of make-believe. From the emperor to the meanest of his subjects a system of high-sounding pretensions to lofty principles of morality holds sway, while the life of the nation is in direct contradiction to these assumptions. No imperial edict is complete, and no official proclamation finds currency, without protestations in favor of all the virtues. And yet few courts are more devoid of truth and uprightness, and no magistracy is more corrupt, than those of the Celestial Empire." Again, "It often happens that one family becomes the possessor of an entire village, and then we have such names as *Chang chia chwang*, 'the village of the Chang family;' *Li chia chwang*, 'the village of the Li family,' and so on. In such cases the seniors of the clan act as the village elders. In larger communities the clans claim jurisdiction over their members, irrespective of the authority of the *tipao* and his council. The clan seniors, however, devote their attention more exclusively to the intimate personal relationships of their members than do the village elders, their object being rather to prevent scandals within their ranks than to preserve public order. In this direction they have been found useful fellow-workers with the promoters of attacks upon Christians, and in the provinces of Hunan and Hupeh they jealously guard their ranks from the imputation of heresy. Any member who is suspected of having joined the foreign religion is haled before the clan tribunal, and is flogged or otherwise tortured in proportion to his obduracy."

What a travesty on Christian endeavor it is to suppose that such a people can be Christianized! Every working missionary, man or woman, who dies laboring for the cause in China is a martyr to a misdirected zeal, and if the immense amount of money drawn from the

[1] Keeper of the Oriental books and manuscripts in the British Museum, Professor of Chinese at King's College.

people in that direction were applied to the purification of the slums of our large cities, in feeding, clothing, and educating the destitute children of those places, results would follow that would gladden the hearts of our people and insure a better citizenship in those localities. Try it, gentlemen; recall your missionaries, locate them as suggested, expend the same amount of zeal and money in trying to reclaim the outcasts and neglected of the United States that you are expending in China, and in ten years you will be astonished and delighted at the result.

It is with a sense of relief that one can turn from a narrative of egotism and barbarism to a brighter picture of enterprise and success.

The empire of Japan (with slight exceptions) had been closed to the world for nearly two hundred years when, in 1852, the United States government placed Commodore M. C. Perry in command of the East India squadron, and appointed him special envoy of the United States to Japan.

"MILLARD FILLMORE, President of the United States of America, to His Imperial Majesty the Emperor of Japan.

"GREAT AND GOOD FRIEND,—I send you this public letter by Commodore Matthew C. Perry, an officer of the highest rank in the navy of the United States, and commander of the squadron now visiting your Imperial Majesty's dominions.

"I have directed Commodore Perry to assure your Imperial Majesty that I entertain the kindest feelings towards your Majesty's person and government, and that I have no other object in sending him to Japan but to propose to your Imperial Majesty that the United States and Japan should live in friendship and have commercial intercourse with each other.

"The Constitution and laws of the United States forbid all interference with the religious or political concerns of other nations. I have particularly charged Commodore Perry to abstain from every act which could possibly disturb the tranquillity of your Imperial Majesty's dominions.

"The United States of America reach from ocean to ocean, and our Territory of Oregon and State of California lie directly opposite to the dominions of your Imperial Majesty. Our steamships can go from California to Japan in eighteen days.

"Our great State of California produces about sixty millions of dollars in gold every year, besides silver, quicksilver, precious stones, and many other valuable articles. Japan is also a rich and fertile country, and produces many very valuable articles. Your Imperial Majesty's subjects are skilled in many of the arts. I am desirous that our two countries should trade with each other, for the benefit both of Japan and the United States.

"We know that the ancient laws of your Imperial Majesty's government do not allow of foreign trade except with the Chinese and the Dutch; but, as the state of the world changes, and new governments are formed, it seems to be wise, from time to time, to make new laws. There was a time when the ancient laws of your Imperial Majesty's government were first made.

"About the same time America, which is sometimes called the New World, was first discovered and settled by the Europeans. For a long time there were but a few people, and they were poor. They have now become quite numerous; their commerce is very extensive; and they think that if your Imperial Majesty were so far to change the ancient laws as to allow a free trade between the two countries, it would be extremely beneficial to both.

"If your Imperial Majesty is not satisfied that it would be safe altogether to abrogate the ancient laws, which forbid foreign trade, they might be suspended for five or ten years, so as to try the experiment. If it does not prove as beneficial as was hoped, the ancient laws can be restored. The United States often limit their treaties with foreign states to a few years, and then renew them or not, as they please.

"I have directed Commodore Perry to mention another thing to your Imperial Majesty. Many of our ships pass every year from California to China; and great number of our people pursue the whale fishery near the shores of Japan. It sometimes happens, in stormy weather, that one of our ships is wrecked on your Imperial Majesty's shores. In all such cases we ask, and expect, that our unfortunate people should be treated with kindness, and that their property should be protected, till we can send a vessel and bring them away. We are very much in earnest in this.

"Commodore Perry is also directed by me to represent to your Imperial Majesty that we understand there is a great abundance of coal and provisions in the empire of Japan. Our steamships, in crossing the great ocean, burn a great deal of coal, and it is not convenient to bring it all the way from America. We wish that our steamships and other vessels should be allowed to stop at Japan and supply themselves with coal, provisions, and water. They will pay for them in money, or anything else your Imperial Majesty's subjects may prefer; and we request your Imperial Majesty to appoint a convenient port, in the southern part of the empire, where our vessels may stop for this purpose. We are very desirous of this.

"These are the only objects for which I have sent Commodore Perry, with a powerful squadron, to pay a visit to your Imperial Majesty's renowned city of Yedo: friendship, commerce, a supply of coal and provisions, and protection for our shipwrecked people.

"We have directed Commodore Perry to beg your Imperial Majesty's acceptance of a few presents. They are of no great value in themselves; but some of them may serve as specimens of the articles manufactured in the United States, and they are intended as tokens of our sincere and respectful friendship.

"May the Almighty have your Imperial Majesty in his great and holy keeping!

"In witness whereof, I have caused the great seal of the United States to be hereunto affixed, and have subscribed the same with my name, at the city of Washington, in America, the seat of my government, on the thirteenth day of the month of November, in the year one thousand eight hundred and fifty-two.

"Your good friend,

"MILLARD FILLMORE.

(Seal attached.)

"By the President:

"EDWARD EVERETT, *Secretary of State.*"

With the above letter and his diplomatic instructions, Commodore Matthew C. Perry (one of the most distinguished officers and diplomats of the United States navy) left for his station in the latter part of 1852, and reached Hong-Kong in April of 1853. With as much dispatch as possible, he made the necessary preparations, and left for Japan, and on the morning of July 8 made Cape Idzu. The appearance of the ships off the Japan coast created an intense excitement among the natives, who surrounded the ships with their boats, trying to intercept and drive them back. No attention, however, was paid to their noise and gesticulations as the squadron steamed slowly in and anchored in the bay.

In a few days preliminary arrangements were made for the delivery of the President's letter. On the day appointed the letter was duly delivered in the midst of much pomp and ceremony, for which the following characteristic receipt was given:

"The letter of the President of the United States of North America, and copy, are hereby received and delivered to the emperor. Many times it has been communicated that business relating to foreign countries cannot be transacted here in Uragawa, but in Nagasaki. Now, it has been observed that the admiral, in his quality of ambassador of the President, would be insulted by it; the justice of this has been acknowledged; consequently, the above-mentioned letter is hereby received, in opposition to the Japanese law.

"Because the place is not designed to treat of anything from foreigners, so neither can conference nor entertainment take place. The letter being received, you will leave here."

When the commodore received this paper, he informed them that he would return in the near future for an answer to the letter. "With your squadron?" asked the intepreter. "Yes, and with more ships."

Thus ended the first official interview with the representatives of the Japanese empire, and the first decisive step taken towards opening the doors of this long-secluded nation to the intercourse and commerce of the world.

Subsequent efforts for an extension of commercial privileges were met with the same persistent opposition that characterized the first approach to the empire.

In a few years, however, their feeling of exclusiveness was so far modified as to send two ambassadors to the United States. And on the 13th of February, 1860, the United States steamer "Powhatan" left Yedo Bay with "Simme Bugen-No-Kami" and "Moragake Awage-No-Kami," with their suite, numbering some seventy persons. *This* was "step" number two, and a very important one.

After the return of these ambassadors to Japan the government solicited permission to send certain of their young men to our military and naval academies. A similar application was made to the European governments, and in every case their requests were promptly granted. This was step in the right direction number three.

In a few years the government had native-born officers (both military and naval) who had been trained in the best military and naval schools in the world. A professional training was not the only advantage that followed the wise course pursued by the Japanese government, that was supplemented by their young men becoming masters of the language of the country to which they had been sent, and to-day there is not a spoken language in the civilized world that you will not find one or more Japanese master of.

Another element of great strength and influence was introduced into the empire,—*i.e.*, the "public press." And to-day hundreds of

newspapers (dailies, weeklies, and tri-weeklies) are published, spreading the current news of the day in all directions, and it is safe to assert that every intelligent citizen of Japan is familiar with the war news.

China can claim to have the oldest newspaper in the world,—*i.e.*, the *Pekin Gazette*. And (as far as I am advised) the only one. The comparison will suggest its own inference.

At the beginning of the present war with China the Japanese government received many applications from foreigners for positions in their army and navy, all of which were respectfully declined.

Thus in the brief period of a generation the empire of Japan has emerged from a self-imposed seclusion and rightly taken her place with the first nations of the earth; and doubtless, hereafter, no question affecting the East will be considered without her presence.

W. H. SHOCK,
Chief Engineer U.S.N.

ORGANIZATION OF THE LINE OF THE ARMY.

VIEWED in the light of organization as exemplified by the practices in every modern army, that of the United States is universally conceded to be very far behind all others, more especially as relates to the line of the army, or the fighting branches which constitute or ought to constitute the very life of any army. Herein we are scores of years behind the requirements enforced by modern progress in the art of war. The line of our army, in its every branch, has an organization confessedly incapable of useful and efficient application under modern conditions of warfare, and there is a universal and persistent demand for a reorganization which is absolutely necessary to put us abreast of the times, and to insure even reasonable efficiency in war, especially under the limiting conditions under which we will have to meet a call to arms.

That our army reorganization should conform to a well-established and recognized *military policy* suited to the requirements of our national life goes without saying. What our military policy should be under our form of government is here hardly worth military consideration, as the Congress apparently has neither the time nor the inclination for its consideration. What that policy really is,—if, indeed, there be any—would be exceedingly hard to define. But there are certain salient features, whether wise or unwise, which are readily recognized, and as these appear to be of controlling force with national legislatures, they must be duly considered by the would-be "reformer" of our wofully deficient army organization. The only well-defined principles which in a measure govern and indicate our military policy are to be found in our fundamental law, the constitution.

First. "A well-regulated militia being necessary to the security of a free state, the right of the people to keep and bear arms shall not be infringed." (Amdts. Art. II.)

Second. "The Congress shall have power [§ 11] to raise and support armies . . .; [§ 14] to provide for calling forth the militia to execute the laws of the Union, suppress insurrection, and repel invasion . . .; [§ 15] to provide for organizing, arming, and disciplining the militia." (Const. Art. I. Sec. 8.)

According to the last report of the adjutant-general of the army, the "militia," so called, of these United States numbered 8,567,258. So far from being the "well-regulated" militia contemplated by the constitution, it is not regulated at all, either by the National or State governments. And in place of these apparently portentous millions of armed defenders, we find in the same report, in place thereof, the pitiful number of one hundred and twelve thousand five hundred and ninety-seven "organized" national guards, without any adequate provision having been made by Congress for "organizing, arming, and disciplining" even this one-eighty-fifth of the militia forces of the country upon which our constitutional military policy bases the security of the Union.

Even the very short period of our country's history has clearly demonstrated that the constitutional "militia" has proved but a broken reed upon which to lean for our security, and it has now fallen into such ill repute that our citizen soldiery consider it a stigma to be termed "militia," and, consequently, organize outside of the terms of constitutional law and parade as national guards. Under the crucial test of the War of Secession these were set aside for the volunteer, as must inevitably be the case in any future war.

As the Congress has so utterly failed to properly provide for a "well-regulated militia" or national guard, it might naturally be expected that due provision has been made for some other military force, as represented by the regular armies of modern nations, wherein the citizen receives due military training, and which is most carefully and completely organized, equipped, instructed, and disciplined. But so far from this being the case we are now confronted with the regular force limited to an enlisted strength of twenty-five thousand men, and the above-mentioned force of one hundred and twelve thousand five hundred and ninety-seven national guards, as a rule, poorly armed and equipped, insufficiently paid, and even worse off respecting organization than the regular army, and that is saying a great deal. All subject to the confused, ever-changing, and unwritten law of our military policy, so called.

(*a*) The Congress has limited the enlisted strength of the regular army to twenty-five thousand men.

(*b*) The Congress has limited the *cost* of the army at large to a fixed sum, presumably to a sum a fraction less than that found in the "last" army appropriation bill,—in the supposed interest of "economy" in government.

(*c*) To what the War Department has at present determined should be the relative strength of the various fighting arms of the service,—viz., one hundred troops of cavalry, eighty-four batteries of artillery, and two hundred companies of infantry, a total of three hundred and eighty-four units of organization, instead of the one hundred and twenty

troops, sixty batteries, and two hundred and fifty companies, a total of four hundred and thirty units actually authorized by law, due to the radical change in the conditions of our military requirements.

(*d*) *Some* reorganization which shall conform to the three limitations above named, and, at the same time, to the requirements of modern arms, tactics, and battle conditions incident thereto.

(*e*) The condition of "expediency" that, though a perfect model as to organization is demanded, it must be so devised as not to materially increase the present number of officers, nor yet, in order to prevent or perpetuate present glaring evils, to materially reduce this number.

As to the first two limitations, they must of necessity be left to the wisdom of Congress. To arrive at an understanding as to the third,—viz., the policy of the War Department,—it is first necessary to give some consideration to the various arms of the service, and to their relative strength in an organized army, ever remembering that the War Department itself is rigidly limited as to the number of enlisted men, to say nothing of the enormous number of details of officers upon special duty away from their regiments, etc.

As to the *infantry*, though it of necessity bears a much larger proportion to the other branches of the service in an organized field army, it, at the same time, is always the most readily raised, armed, equipped, instructed, and disciplined, and much the most economical to maintain, man for man, whether in peace or war.

For the *cavalry* we have, to start with, much the same conditions as to instruction and discipline, but in addition a more complicated armament and equipment, and in addition the *horse*, an element of cost, and of further expenditure of time, not only in his training, but of his rider also, to enable him to make proper use of the animal, as well as to care for him.

For the *field artillery* we start with a combination of the conditions for both the infantry and cavalry, and have in addition the complications incident to its special arm.

For the *sea-coast artillery* we are now confronted with a special and highly scientific branch of a service whose modern enginery of warfare has become one of the wonders of the ages,—complicated, costly, and of tremendous power,—*when it hits*. When it costs nearly a thousand dollars to fire a gun in war, it requires no further argument to prove, at least, that it does not "pay" to *miss*, and this evil can only be avoided by a thorough training of a superior class of men. As this branch of the service must hang our banner on the outer walls of our land-defenses and maintain its honor in the face of an enemy's first attack, it must be the first to meet him, and therefore should stand first in the order of readiness to resist such attack. It will require far more time and intelligence for its members to acquire effective use of its ponderous, complicated, and costly armament. To properly man

the modern defenses, designed for but twenty-seven of our most important sea-coast ports, will require eighty-five thousand thoroughly-trained artillerymen, and for some of the other ports, presenting less depth of water in the approaches from the sea, defended with our present guns, there will be required in war twenty thousand additional artillerymen.

It is to a small extent, and unquestionably should be to far greater extent, the policy of the government to maintain at the maximum strength those arms of the service requiring most time and difficulty in their training, and especially those entailing the greatest cost for maintenance; not alone because they cannot possibly be improvised in the event of a war on account of this *time* element, but also for the reason that these are the very arms of the service that can neither be trained nor maintained in the national guard at a cost which will be within the very small limit as to funds available for such purposes. Therefore it is clearly evident that our policy should be to maintain our regular forces in proportion to the following order of relative importance:

1. The sea-coast artillery.
2. The field artillery.
3. The cavalry.
4. The infantry.

And this despite the fact—leaving out the sea-coast artillery as forming no part of a field army—that, in an army in the field, the order of relative strength would be exactly reversed.

Emphasis is given to this order by the fact that of the total strength of one hundred and twelve thousand five hundred and ninety-seven men at present found in the national guard about one hundred thousand are in infantry, six thousand field artillery (including "machine-gun" batteries), and about five thousand cavalry, so called. Thus, for our total organized forces supposed to be available upon great emergency, we have about the following proportions,—the infantry being taken at unity:

Infantry	1, which should be	1
Cavalry	$\frac{1}{12}$, which should be	$\frac{1}{6}$
Field artillery	$\frac{1}{20}$, which should be	$\frac{1}{10}$

As a matter of course, the sea-coast artillery bears no relation to any proportion of our organized field army, but must be adequate to the defense of the coasts of a particular country. Yet, great as is the manifest demand for strength in this arm of the service for the defense of our enormous extent of sea-coast, it is by far relatively the weakest branch of our service, and finds no representative or reliance in the national guard.

It thus appears that, if we are to consider the national guard as

available for war, as seems to be a favorite fad with many, if we are to limit our regular forces to twenty-five thousand men, these should be assigned almost exclusively to the sea-coast artillery, cavalry, and field artillery, these arms being but poorly represented in the guard, which must always be the case through conditions of cost alone. But no one of less intelligence than an idiot could wisely advocate the abolition of the regular infantry, no matter what might be the strength of that of the national guard, or the excellence of its armament and the training possible. Beyond all question of doubt, there must be a sufficient number of infantry regiments in the regular forces to form a nucleus around which other forces can form, and especially to form a point of resistance to attack from without. There should be a sufficient number of such regiments to form an army corps, which, in our service, could not well be less than twelve, to which must be added at least fifty per cent. as now available from distance from the point of consentration, necessity for other duties, etc. So that eighteen regiments must be considered as the minimum for the regular forces, no matter what may exist in the national guard, or what may be considered as to its real value as a national defense. As history teaches that the latter is very small, the idea of substituting it for the regular army or any part of it may as well be abandoned. The dream of some, that we can dispense with all of the regular army except the staff, and, by expending the sum which the line now costs upon the national guard, thereby increase our defenses, is merely a dream. Were such a condition realized, the staff would soon find that they could have no real authority over the guard, whereupon it would be abolished,—the dog in striving for the shadow would lose his bone, and in this case the dog would go also.

These, then, are some of the reasons why the War Department has fixed upon a policy apportioning to the artillery eighty-four batteries, cavalry one hundred troops, and to the infantry two hundred companies, and it is expediency alone which prevents a larger proportion for the first two.

The problem before us, then, is to combine these units into modern organizations under the conditions precedent as heretofore stated.

First in order comes the sea-coast artillery, and as distinguished from the field artillery. Every one now understands that the latter, as its name implies, forms part of a field army, and has no more connection with sea-coast forts than has the infantry or cavalry. By professional soldiers everywhere the disassociation of these two arms of the service is held to be an axiomatic necessity which admits of no argument, and everywhere the organizations are found to correspond with this principle,—the two branches of the service being entirely separate and distinct, the one forming a corps of scientific sea-coast artillery, the other being organized into regiments and forming part of the field army the same as regiments of cavalry or infantry; the only

notable exception being in the English regiment of Royal Artillery, which comprises a corps of two hundred and four batteries, embracing both branches of this arm of the service, though each branch is differently organized and administered. But that these two branches should be separated and organized as in the other armies of Europe is the almost universal opinion of the ablest officers of the Royal Artillery. That our sea-coast artillery should be organized much after the same manner as our corps of engineers is the opinion of nearly all of our ablest and most experienced officers, with but one condition,—viz., that, unlike the corps of engineers, *a corps of artillery should be under the command of the general commanding the army, and strictly confined to its legitimate artillery duties.* The regiments of field artillery would of course be under the immediate command of the army generals, the same as any other regiments of the line. The fear that a corps of artillery will get out of the command of the general is the secret of most if not all of the opposition to such an organization in our service. But this is a matter which Congress can readily reach and control at all times, even if there was any such disposition in the artillery to be considered as anything but one of the *fighting* arms of the line of the army.

That the field artillery should have a regimental organization goes without saying, as such is the case in all modern armies, practically even in the Royal Artillery. The field artillery of an army is nominally brigaded or organized into suitable bodies of horse and mounted batteries, or into brigades comprising both. But it is generally conceded that each regiment should comprise but one class of batteries, and that the regiment should then be such as best adapted to the organizations of the infantry or cavalry for war purposes. For instance, it is generally conceded that a cavalry division will best meet war requirements if composed of three brigades, and that to such a division there should be assigned a battalion of three horse batteries, first, because this gives a suitable number of guns proportioned to the cavalry strength, and, secondly, because the brigades of the cavalry division are frequently separated for greater or less periods of time, have to march and fight upon separate roads, etc., and when this occurs there will be a battery for each brigade. This at once determines the horse artillery battalion, or organization next above a battery, as one of three horse batteries. Furthermore, a battalion of three horse batteries numbers five hundred and twenty-five men and six hundred horses, a total of eleven hundred and twenty-five men and horses, eighteen guns, and thirty-three other artillery carriages; a battalion whose strength and importance is fully equal to that of any other in an army. If a cavalry corps were formed, two divisions would constitute as large a body of mounted troops as it would be possible to manœuvre in any ordinary country, and a regiment of horse artillery composed of two battalions would furnish its complement of artillery,

there being no corps artillery here as with the infantry army corps. Again, to each army corps there should, in a favorable country, be apportioned a cavalry division, in which event a regiment of horse artillery assigned to the army corps would furnish one battalion for the cavalry division and the other for the horse artillery of the corps artillery. This regiment would comprise one thousand and fifty men and twelve hundred horses, total twenty-two hundred and fifty-six men and horses, with thirty-six guns and sixty-six other artillery carriages, and also the usual baggage wagons, and, as a colonel's command, certainly quite the equivalent of any cavalry or infantry regiment.

For a regiment of mounted artillery the same principle applies. Army corps are generally composed of two infantry divisions, to each of which about four field batteries are assigned, which would fix the battalion here as one of four batteries, or seven hundred men, five hundred and seventy-six horses, total twelve hundred and seventy-six men and horses, with twenty-four guns, and forty-four other artillery carriages. The two divisional artillery battalions would naturally form a regiment of mounted field artillery of fourteen hundred men, eleven hundred and fifty-two horses, total twenty-five hundred and fifty-two men and horses, with forty-eight guns and eighty-eight other artillery carriages, besides the usual baggage-wagons, etc. Thus, considering the nature of the respective services, the regiment of six horse artillery batteries is about the equivalent of that of eight mounted batteries, and, in either case, certainly the equivalent of any other regiment in an army.

The army corps also generally has eight or nine mounted batteries attached to it as the corps artillery, and a regiment, the same in organization as that for the divisional artillery, will furnish the corps artillery, to which would be added a battalion of horse artillery, the second battalion being assigned to the cavalry division. This would give for the organizations proposed,—

Regiment of infantry	1764 muskets.
	3
Brigade	5292 muskets.
	2
Division	10584 muskets.
	2
Army corps	21168 muskets.
One regiment divisional artillery	48 guns.
One regiment corps artillery	48 guns.
One battalion corps artillery (horse)	18 guns.
Total	114 guns.

This would give nineteen, or counting the cavalry battalion, twenty-two batteries to an army corps and its cavalry division. Hohenlohe,

in his "Letters on Artillery," pp. 389–90, says, under the head of organization, "The following appears to be a very desirable organization for the artillery:

"Each army corps to have three regiments of artillery; of these two to be of field artillery, and to consist each of two brigades of three batteries; the third to be a regiment of horse artillery, and to consist of three brigades of three batteries each. If with this organization we find that we are weaker in field guns than the neighboring states, I should propose to increase the number of batteries in a brigade of field artillery to four. On mobilization one regiment of field artillery would be attached to each infantry division, and a brigade of horse artillery to each cavalry division. The remainder of the regiment of horse artillery would form the corps artillery." It will be noted that this authority advocated attaching all of the field artillery to the divisions, and forming the corps artillery exclusively of horse batteries on account of their superior mobility. But this plan has not been followed in the German army. October 1, 1890, the nominal organization was into brigades of two regiments each, one brigade being attached to each army corps (three Bavarian corps had three regiments each). The first regiment of each brigade had three battalions of three mounted batteries each and one battalion of two horse batteries. The second regiment had three battalions of three mounted batteries each, or seven battalions, twenty batteries, one hundred and twenty guns to an army corps of twenty-four thousand muskets, or five guns per one thousand muskets. In 1893 the German field artillery was considerably increased, but the details of the organization are not yet known; but the number of guns per one thousand muskets in an army corps is now 5.5.

The organization as above indicated would give 5.4 guns per one thousand muskets. Military writers are in the habit of giving rules as to the number of guns per one thousand muskets that should obtain in an army. "The Almighty favors the greatest number of guns," other things being equal. Given as good guns, we not only must have at least as many as an enemy, but, with volunteer troops, a greater number, for it has always been an axiom that the poorer the quality of the troops the greater should be the number of guns proportionally, and as we must fight with volunteer armies, we must be prepared to take into the field the maximum—not the minimum—number of guns which the field of operations will admit of.

A German army corps numbers twenty-four thousand muskets, but it is the general testimony of the ablest generals of our late war that our army corps of volunteer soldiers should not exceed about twenty thousand muskets, even with veteran troops. This is a command for an experienced corps commander with good troops, and certainly should not be exceeded with volunteer troops and inexperienced commanders.

It thus appears that the organization proposed for the field artillery will meet the general requirements of the probable organization of a field army such as we will have to resort to for war purposes. But it must be remembered that the interests of the other arms of the service will cause them to scan the proportion of the field artillery relative to their own. Very well then. Taking the infantry as a basis, its war strength for eighteen regiments will be thirty-one thousand seven hundred and fifty-two muskets. With 5.5 guns per thousand muskets this strength would call for one hundred and seventy-six guns or twenty-nine batteries, three and five-eighths regiments of mounted artillery alone, whereas there is proposed only twenty-two batteries, three regiments, including one regiment of six horse batteries. There should be four regiments of mounted artillery alone. But no account has been taken of the artillery train, which has become of as great importance as the batteries themselves. To supply the losses of ammunition, material, men, and horses due to campaign and battle, and to man and horse the artillery trains of an army corps (divisional and corps, etc.) will require a complete regiment of mounted field artillery. So that were the field artillery given the proper strength proportional to the infantry and cavalry proposed, there would be required five regiments of mounted and one and a half regiments of horse artillery, and even this takes no account of the requirements of the siege artillery and its train.

As the battalion, especially in our service for all these arms, is *the tactical* unit, it may be well before going further to consider first organization in general, and then that of the battalions and of higher combinations.

History very clearly teaches that, under the conditions of the past, reliance was had to perfection in drill and formal manœuvres for successfully directing men in numbers against the weak point of an adversary. Now, it is clear that a complete change has come over the very principle by which armies are held together, and the commander must depend instead upon the perfection of *organization* and of a training adapted to make each man ready when required to apply sound principles in every emergency, and, above all, as soon as possible voluntarily to place himself under authority again so as to secure unity of action. To summarize in a single sentence, and employing the word organization in the larger sense, the change consists in the substitution of organization for drill as a means of battle action,—in other words, a living organism must take the place of a mechanical instrument. An army in battle is no longer a mere mechanical weapon in the hands of its commander. No doubt many of the preliminary movements will still be accomplished in accordance with the old drill, yet, for at least the very mile and a half over which the issue has actually to be fought out, formal drill has vanished utterly.

All effective movements and co-operation depend upon perfect organization, and on a training which must make every officer and every man know almost instinctively what to do and what decisions to form as each emergency arises. There is now no possible way of securing complete correspondence of working a unity amid great diversity without devising a form of organization which shall assign to every man an adequate share of work and of responsibility by bringing a limited number of men at each step under the authority of one, those so placed in authority being themselves at the next stage, in limited number, also under one man's authority. This is evidently the spirit of any organization from times the most ancient. But within a single generation, while the science remains unchanged, the art of war has changed more than it has every changed since the advent of gunpowder.

As the art of war has always kept pace with the arts of peace, so in reading the history of nations we dwell in succession on the proudest days of all the great nations of the earth, and learn that when this art was neglected the fall of the nation was seldom far distant, and as war has always been a progressive art, each great military power succumbed in turn to a science and an organization superior to its own. By far the most important factor of this art relates to the organization of armies, and at the same time this, of all others, is the very one with which legislatures can most readily deal, for the principles of organization are comparatively simple, its chief object, of course, being to maintain control, *command*, of men in battle. Organization, however, is of two kinds, tactical and administrative; the first having reference to action on the battle-field, and the second to general maintenance in peace as well as in war. These are now combined; the regiment being primarily the administrative and the battalion the tactical unit only; but as the battle-field is the ultimate object of all military organization, it must of necessity conform to the tactical requirements of the day. In this connection it may be well to consider the genesis of the *command* of this organization, whatever may be its form. The command of a regiment, both tactical and administrative, is vested in an officer with the now universal title of colonel, while the immediate command of its tactical subdivisions or battalions is vested in his "deputies," or "lieutenant-colonels," who in turn are each aided in tactical command by one or more "majors," or officers "over" or "above" the captains of the companies or subdivisions whose combination makes up the battalion. As the title indicates, a major, properly speaking, is not and never was a "commanding" officer, he is and was properly an over officer found necessary to aid the colonel's deputy, the lieutenant-colonel, in the proper execution of his duties in camp, on the march, and on the battle-field. This is a point of no small importance in our service, for while we appear to find no legitimate tactical duties or importance attaching to the office of a lieutenant-colonel of a regiment, in all foreign

services this officer is one of the greatest importance, and is in fact so in all of our staff departments, while in the line of our army we have practically converted this important officer into a "fifth wheel" to the military wagon, and have deprived him of all tactical dignity and importance. The reason is that, during the Revolution we took the English ten-company battalion (from one to four battalions constituting an English regiment), commanded by a lieutenant-colonel, and called it a "regiment," giving to it the proper regimental commander, a colonel, in addition to the regular battalion and other officers. This, of course, reduced the lieutenant-colonel from the dignity of a "commanding" officer, and in fact placed him exactly on a par with his major so far as tactical duties were concerned, as the colonel commanded in person and there could be no room for his "deputy." Even our drill-books now ignore him, and uniformly and improperly assign a battalion to the command of a "major," who is not now and never was, as the etymology of the title indicates, a "commanding" officer. When the English army made history, it was represented by its battalions commanded by lieutenant-colonels. The regiments had colonels, a prince of the blood often held the colonelcies of half a dozen or more regiments, but it was for "revenue only." Gentlemen of the infantry, instead of striving after "majors" to command your battalions, it would be far better to restore the old historic lieutenant-colonels of the English battalions, whose efficiency has spread English dominion over the face of this green earth.

As to what are the tactical requirements of the day governing the organization of the tactical unit the battalion of infantry can readily be deduced from the inexorable logic of present far-reaching and death-dealing arms. The solid and invincible column launched into the battle by its commander as mechanically as a battering-ram against a wall has vanished utterly. Yet in many cases now, as for the Roman legion of old, it still requires a force of twelve men in depth to the yard of front, or even of sixteen men, as in the Greek phalanx, to insure the carrying of an enemy's position. It is just here that the great difficulty arises, for, instead of forming up the twelve or sixteen men one behind the other within a depth of one yard per man, it is now necessary to extend them over a depth of from six hundred to sixteen hundred or more yards, and still maintain the control necessary to bring them up to the point of attack at the proper moment and in good condition, both morally and physically, and with the minimum of loss from the enemy's far-reaching and dangerous fire. This depth of sixteen yards in one case and of sixteen hundred in the present can be taken as a very good measure of the relative ability required of the officer to fight the ancient as compared with the modern organization, and it also very clearly indicates why a most perfect and living organization is now required to enable the officer to gather up his men appar-

ently scattered to the four winds of heaven, and finally launch them against the objective point in sufficient force to carry it. It is perfectly obvious that however perfect may be the organization, in place of the simple method of these ancient organizations we must now have a perfect system of tactical *command*, otherwise our organization will prove worthless however perfect it may be in all other respects.

For the infantry it appears to be generally conceded that modern tactical requirements as to the fighting line with its supports and reserve, cannot well be fulfilled with a company of less than about one hundred and fifty strong. As the other extreme, it has been found from practical battle experience that with two hundred and fifty men to a company, proper control cannot be insured by the captain, unless he be mounted or virtually a field officer. Between these extremes, then, must be found the proper strength of the company, also remembering that this strength depends for proper control upon the number and efficiency of its officers and non-commissioned officers. But what is of far greater importance for us is the fact that, though we are devising an organization for our little regular army, it must in war serve as a model to be supplied with volunteers, and not with trained and disciplined regular officers and men. Consequently we are forced to the conclusion that it is the part of wisdom to confine the number of men in our company to the minimum, which will admit of the practical application of modern tactical principles, and it will be admitted that one hundred and fifty men is as great a number as a captain of infantry can command in battle in a volunteer army, and even this number must be held inadmissible unless there be provided a good supply of lieutenants and non-commissioned officers, and a simple, compact, and completely officered form of battalion organization.

For the latter four companies is the almost universal number assigned to a battalion, which would give us an enlisted strength of six hundred men, which is greater than the average strength of a regiment at the front in our late war, when a fair degree of discipline and efficiency had been reached, and this regiment, it must be remembered, was then the tactical unit now corresponding to the battalion. The battalion is the tactical unit of the regiment, and its natural and proper commander is unquestionably a lieutenant-colonel. Now, the tactical conditions of battle require the division of this battalion into a fighting line and its reserve, generally secured in the simplest and probably the best manner with two companies in each. In the fighting line with its two companies—or their equivalent in another formation—we have three hundred men, with two captains. But we have already decided that a captain cannot efficiently command more than one hundred and fifty men in battle, consequently he cannot efficiently command three hundred, and then naturally results the necessity for a "major" or over officer, and mounted, to properly command this subdivision of the bat-

talion in battle. And, in fact, the same should hold equally true for the two companies in the reserve, and for volunteer battalions at least there unquestionably ought to be two majors, as the lieutenant-colonel is the commander of the whole, and cannot abdicate his duties and responsibilities as such in order to assume those of a part of his command. But in the proposed organization only one major is provided for, which will force the lieutenant-colonel to assume the direction of either the reserve or fighting line as he may deem best. For purely tactical purposes the battalion commander must and always has the assistance of an adjutant, a sergeant-major, trumpeter, and a clerk, and these must be provided for in the organization or be detailed from the companies, a useless and detrimental expedient which should not be tolerated, especially as the reorganization affords a surplus of lieutenants which could not be utalized to such good purpose in any other way. As the colonel is undoubtedly the proper regimental commander, we have here not only a common-sense development of this most important part of a military hierarchy, but a perfect illustration of the etymology of the titles given to the various grades,—viz., lieutenant-colonel, as the "assistant" or "deputy" of the colonel, himself a commanding officer for tactical and disciplinary purposes, vested with the power and aids for tactical though not for administrative command, while the "major," as his title indicates, is simply the superior of the captain,—a fighter, necessary to meet the tactical exigencies of battle, the camp or march, and to enable the lieutenant-colonel to properly and efficiently command and fight his battalion.

The number of battalions in an infantry regiment at the front in war is generally three, and we in this country seem to ignore any necessity for a depot battalion. With our normal battle formation, with all of the battalions in line, there will be five men in depth to a yard of front; with two battalions in the first and one in the second line seven and a half, and with a front of one battalion there will be a strength of 15.4 men per yard of front, almost exactly the same as for the old Greek phalanx, though, of course, in a vastly different formation. This strength for our line of battle is based upon the drill regulation, allowing a front of twenty-eight inches per file in ranks. We had plenty of illustrations in our late war of the fact that fifteen men per yard of front were not equal to carrying positions defended by resolute men armed with the old muzzle-loading arms. Going back to the old close-order formation of twenty-two inches front per man, the strength of the attack would be increased to nineteen per yard of front. Modern arms may be relied upon, one would suppose, to produce all the "interval" necessary, and necessitate more men to carry a position. If this be true the present extra six inches had better be "closed up."

The tactical requirements as to command, discipline, etc., for a battalion of cavalry are precisely the same as for the infantry, save,

perhaps, that there should be a "chief of squadron,"—*i.e.*, a "major" for every squadron,—especially when the troop is increased in strength, though, of course, the actual formations and methods of fighting are widely different. As for the responsibility, etc., attached to this battalion, it must be remembered that a horse counts for quite as much in war individually as his rider, in fact requires far more time and care to keep him in efficient condition and to handle him in rapid manœuvres in battle. The men and horses in a battalion number nine hundred and sixty in war, and with only two battalions to a regiment there will be nineteen hundred and twenty men and horses, as against eighteen hundred men in a regiment of infantry. The organization proposed will give eight troops to a regiment, the same as for a German cavalry regiment in the field during war, there being in this regiment two other troops which upon mobilization give up part of their men and horses to the others, and remain in depot to collect men, horses, etc., for the regiment at the front; a feature which finds no application in our service. Furthermore, the German regiment in war has only five hundred and ninety-two sabres, and is divided into eight troops and four squadrons. It may be seriously questioned whether a cavalry colonel in our service should be required or expected to efficiently command nearly a thousand men, when in nearly every service in Europe his command is limited to six hundred or eight hundred men at most. But there is this to be said for the proposed organization,—there will be in war four officers to a troop, a lieutenant for each of three platoons, a complete set of non-commissioned officers for the direct command of the six sections and twelve squads, into which the drill-manual divides the troop. Furthermore, each battalion is made a complete tactical unit, but short one squadron commander, of but four hundred and eighty men, and though our colonel will be burdened with a greater number of men and of responsibility, he will have very nearly equal facilities for administration, and better ones for tactical command than the European cavalry colonel. If it be deemed wise all over Europe to limit the command of a cavalry colonel to six hundred or eight hundred men, what must be thought of our present ponderous and unwieldly cavalry regiment with a war strength of twelve hundred! To this preposterous regimental organization much of the inefficiency of our cavalry during the first two years of our late war is no doubt due. It not only required two years to properly train and instruct our cavalry, but it also took about the same period to reduce the number of men in a regiment down to a reasonable and practicable limit necessary to permit of efficiency, and which beyond any question of doubt had quite as much to do with rendering them efficient in that war as their training and experience. Again, this organization, like all the rest, must be devised to serve as a model for volunteer cavalry in the event of war. If the experienced German cavalry colonel,

aided by a corps of the best-trained cavalry officers to be found anywhere, must be limited to a regiment of five hundred and ninety-two sabres in war, does anybody think it wise upon our part to turn loose a volunteer colonel, with untrained officers, and twelve hundred untrained and undisciplined men, and as many unbroken horses? The proposition is grotesquely absurd upon its face.

The systems of organization having been outlined and explained, it remains to be seen how best they can be applied under the conditions as to our military policy: first as to the number of minor organizations fixed by the War Department.

Arm.	Secured.	War Department.
Sea-coast artillery, batteries	60	70
Field artillery, batteries	22	14
Cavalry troops	96	100
Infantry companies	216	200
Totals	394	384

The total number now fixed by law is four hundred and thirty. This is as near to the conditions precedent as can be arrived at without a considerable change in the number of officers, this case the reduction is three officers.

REORGANIZATION: RECAPITULATION.

	Engineers.	Artillery.		Cavalry.	Infantry.
Regiments	Corps.	Corps.	Field. 3	12	18
Brigadier-generals	1	1	..	..	..
Colonels	6	5	3	12	18
Lieutenant-colonels	12	10	6	24	54
Majors	24	20	6	24	54
Captains	30	60	22	96	216
Captains, adjutants, and quartermasters	..	6	6	24	36
First lieutenants	26	60	22	96	216
First lieutenants, battalion-adjutants	..	12	6	24	54
Second lieutenants	10	60	22	96	216
Totals	108	234	93	396	864
Enlisted men	500	3300	1848	5280	11880
Present establishment, officers	108	280		430	875
Increase or reduction	..	+42		— 34	— 11
Field officers, per cent.	39	15	16	15	14
Subaltern officers, per cent.	61	85	84	85	86
Officers per man, per cent.	0.21	0.074	0.005	0.075	0.073

Present legal organization . . . . . 430 companies.
Present War Department organization . . . . . 384 companies.
Proposed organization . . . . . 394 companies.

The engineer corps is introduced in comparison to show why its promotion is fair and reasonable, as an inspection of the relative proportions of officers in the different grades in this corps will at once reveal the reasons, and also why in the line it has been found so destructive to its best interests, for the actual status is at present worse than the showing under the proposed reorganization. In the line, the necessity for maintaining a very large proportion of subaltern officers is imperative to insure efficient command of troops, and, therefore, will always render promotion therein inadequate to the best interests of the service in times of peace.

But we have here to deal with military organization based upon purely tactical and administrative requirements, with which promotion has nothing whatever to do. Any modern reorganization whatever for the line of our army would inevitably result in considerable promotion to the higher grades for the older officers, who with few exceptions have seen war service, simply because modern arms have "dispersed" the old compact, close-order formations, and this dispersion necessitates a much larger number of mounted or field officers to supervise and command the men scattered over large areas of ground on the battle-field. For instance, the Greek grand phalanx, sixteen thousand strong formed-up, covered a front of one thousand by sixteen yards in depth, covering an area of sixteen thousand square yards. Now, a single battalion of only six hundred men, in modern battle formation, will cover a front of not less than two hundred and thirty-three yards, with a depth of six hundred and fifty, covering an area of one hundred and forty thousand square yards. In other words, the small battalion of the present day, one-twenty-sixth the strength of the ancient phalanx, covers more than eight times as much ground. This is one of the greatest of reasons why in every infantry battalion there should be two majors instead of one. In the cavalry there also should be two, one as chief of each of the squadrons. In the field artillery the same holds good, one major being required to immediately command the guns, the other the ammunition reserve of the firing line. Though it may be inexpedient to apply this in our regular army, it should unquestionably be applied in any organizations of the volunteers for war.

That the most perfect organization which wisdom can devise should exist for our little regular army is of vastly greater consequence than for any other army in the world, as it should be, in fact, but the model for the instruction of our officers and use of the national guard, and for the volunteers who must inevitably form our armies in the event of war. And it must be particularly remembered that when a volunteer army is formed, most of its officers will be anything but thoroughly instructed even in the commonest duties of an officer, and the only practicable solution of this difficulty apparently is in a measure to

make up in quantity what is lacking in quality. But even then, as we must develop our model in the regular army, first, we will not probably be allowed by the Congress a greater quantity of officers than obtains in other services wherein the quality may be of the very best. Supposing we were even allowed the two majors to a battalion, in the infantry, for instance, we should then have ten field officers to a regiment. It will at once be said that in our last war there were but three field officers. A sufficient answer ought to be found in the fact of the vastly changed order of battle. But without going into the question of the greatly-increased range of modern arms and the tactical changes resulting therefrom, let it only be considered that ten field officers are required for the efficient command of eighteen hundred men as provided for in the organization; there being fifty-three subaltern officers in the regiment on a war footing. This will give one field officer to one hundred and eighty men, and one subaltern to each thirty-four men. In our old war regiment there were a thousand men, three field and thirty-two subaltern officers, or one field officer to three hundred and thirty-three men, and one subaltern to each thirty-one men; thus it appears that the great dispersion of the men caused by modern arms changes the proportion of field, slightly at the expense of the subaltern, officers. But, taking the entire number of officers, we find that in the new organization, even if allowed two majors to a battalion, there will be only one officer to 28.5 men, while in the old war regiment this proportion was one to 25.7 men, and in fact we will have a less proportion of officers than formerly, and, save in the necessary grades of field officers, we have not improved as respects "quantity." In regular armies both quantity and quality are carefully attended to, and, furthermore, the very important item of non-commissioned officers is thoroughly attended to. This latter class of officers, in the present dispersed order of fighting, has become possibly of as much importance in many cases, at least for sergeants, as was a lieutenant in the old compact, close-order formation, and their number at least must be absolutely equal to the requirements of the tactical battle formation; there must be a corporal for each squad and a sergeant for each section.

When it comes to providing a proper organization for the line of our insignificant little regular army, *cost* should have little consideration at the hands of a wise Congress, as in war this so-called army becomes but a drop in the bucket compared with the real army of volunteers which must be depended upon to fight our battles. We should have a good model of organization suited to the requirements of our own country at whatever cost.

That the changes proposed should appear startling to the conservative mind cannot be surprising. Our organizations generally antedate the present century, and were all of the changes which have taken

place in any art within the past hundred years, and which have so much to do with mechanical appliances as has the art of war, to be suddenly paraded before us, the change would indeed be far more startling.

No attempt has been made to fit a condition—whether of service or of officers—to any theory, save only the conditions as to our recognized military policy as heretofore stated, but each element of organization is believed to have been based upon sound and well-recognized tactical requirements of present arms and battle conditions, modified only by the ever-present condition that such organizations not only must meet their application by thoroughly educated and trained regular officers in command of regular soldiers, but must be applied in a volunteer army in war, where professional soldiers must of necessity be few in number.

The increased cost involved, for the first year, will be less than one hundred thousand dollars, and less in succeeding years, and if a modern reorganization is not worth this paltry sum, it is not worth asking for.

Finally, there are unquestionably many officers in the army who can present a more perfect scheme of reorganization, but until they do so, they should at least hold their peace. *All* can criticise with a vengeance, but the critics should also hold their peace unless the criticism is accompanied by an indicated improvement. One thing is certain, unless we all pull together, and that with a will, nothing in the way of reorganization will ever be accomplished. If a decided majority of the officers of the line of the army will indorse this, or any other practicable scheme, it will meet with the approval of the Congress in short order; without such unanimity among the officers of the line nothing will be done.

NOTE.—The following is probably the best form of legislation necessary to secure a proper organization for the line of our army:

A BILL

TO PROVIDE A MODERN ORGANIZATION FOR THE LINE OF THE ARMY.

SECTION 1.—*Be it enacted*, etc., that hereafter the line of the Army shall consist of a Corps of Artillery, three regiments of Field Artillery,—one of horse and two of mounted artillery,—twelve regiments of Cavalry, and eighteen regiments of Infantry. Two regiments each of cavalry and infantry shall be composed of colored enlisted men, as now provided by law.

SEC. 2.—That the Corps of Artillery shall consist of one brigadier-general, chief of artillery, five colonels, ten lieutenant-colonels, twenty majors, six staff-captains, to be extra captains selected from the captains of the Corps of Artillery by the chief of artillery and the colonels, twelve staff first lieutenants, to be extra first lieutenants selected from the first lieutenants of the Corps of Artillery by the chief of artillery and the lieutenant-colonels, sixty captains, sixty first and sixty second lieutenants, five sergeants-major, five quartermaster-sergeants, ten battalion sergeants-major, five chief musicians, ten principal musicians, five chief trumpeters,

ten color-sergeants, and sixty batteries of Sea-coast Artillery. *Provided*, that all officers of the Corps of Artillery below the grade of colonel shall be subject to the present law governing examinations for promotion and retirement.

SEC. 3.—That each battery of the Corps of Artillery shall consist of one captain, one first and one second lieutenant, officers of the Corps of Artillery provided for in Section 2 of this Act, one first sergeant, four sergeants, four corporals, two musicians, two artificers, and fifty privates. *Provided*, that the President, when he may deem it necessary, may add to the above battery organization one second lieutenant, and not to exceed four sergeants, eight corporals, one armorer, three machinists, three electricians, and one hundred and sixteen privates.

SEC. 4.—That the chief of the Corps of Artillery shall, in time of peace, be appointed by seniority from the colonels of the Corps of Artillery, and shall be a member of the staff of the general officer in command of the Army and under his direction, shall have command and supervision of the instruction, administration, and discipline of the Corps of Artillery, and with the approval of the general in command of the Army and the Secretary of War, he shall determine and regulate the armament and equipment of the Corps of Artillery. The pay and allowances of the officers and enlisted men of the Corps of Artillery shall be the same as now fixed by law for like grades in the Corps of Engineers. *Provided*, that the pay of all sergeants-major in the line of the Army provided for in this Act shall be thirty-five dollars per month, and of battalion sergeants-major thirty dollars per month.

That the pay and allowances of all chief trumpeters shall be the same as now fixed by law for like grades in the Cavalry, and of all battalion trumpeters the same as for trumpeters of Cavalry, and that the pay and allowances of armorers, machinists, and electricians shall be the same as now fixed by law for hospital stewards first-class, and that the pay and allowances of veterinary surgeons shall be the same as now fixed by law for a veterinary surgeon of Cavalry, and that all enlisted men of the line of the Army shall be entitled to re-enlisted pay and other allowances as now fixed by law. *Provided further*, that veterinary surgeons now in the service shall be assigned to regiments or battalions of the mounted service as the President may direct.

SEC. 5.—That the regiment of Horse Artillery shall consist of one colonel, one adjutant, one quartermaster, one veterinary surgeon, one sergeant-major, one quartermaster-sergeant, one saddler-sergeant, one farrier-sergeant, one chief musician, two principal musicians, one chief trumpeter, two color sergeants, two privates, clerks, and two battalions. The adjutant and quartermaster for all of the regiments provided for in this Act shall be extra captains selected from the captains of their respective regiments. A battalion of Horse Artillery shall consist of one lieutenant-colonel, one major, one battalion adjutant, one veterinary surgeon, one battalion sergeant-major, one battalion farrier-sergeant, one corporal, one battalion standard-bearer, one battalion trumpeter, one private, clerk, and three horse artillery batteries. The battalion adjutants provided for in this Act shall be extra first lieutenants selected from their respective battalions. A battery of Horse Artillery shall consist of one captain, one first and one second lieutenant, one first sergeant, one stable and veterinary sergeant, one quartermaster-sergeant, six sergeants, nine corporals, four artificers, two trumpeters, one guidon, one wagoner, twenty-seven drivers, forty-eight cannoneers, and one hundred and twenty-nine horses: *Provided*, that the President, when he may deem it necessary, may add to the above battery organization one second lieutenant, three corporals, two artificers, twenty-one drivers, fifty-six cannoneers, and one hundred horses, and that he may, in his discretion, designate and cause one battalion of the regiment of Horse Artillery to be armed and equipped as mountain artillery. *And provided further*, that the pay and allowances of the officers and enlisted men of the regiments of Field Artillery shall be the same as now fixed by law for those of like grades in the Cavalry, and that the pay of all the battalion farrier-sergeants provided for in this Act shall be twenty dollars per month.

SEC. 6.—That a regiment of mounted Field Artillery shall consist of one colonel, one adjutant, one quartermaster, one veterinary surgeon, one sergeant-major, one quartermaster-sergeant, one farrier-sergeant, one saddler-sergeant, one chief musician, two principal musicians, one chief trumpeter, two color-sergeants, two privates, clerks, and two battalions. A battalion of Mounted Artillery shall consist of one lieutenant-colonel, one major, one battalion adjutant, one veterinary surgeon, one battalion sergeant-major, one corporal, battalion standard-bearer, one battalion trumpeter, one private, clerk, and four mounted batteries. A battery of Mounted Artillery shall consist of one captain, one first and one second lieutenant, one first sergeant, one stable and veterinary sergeant, one quartermaster-sergeant, six sergeants, nine corporals, three artificers, two trumpeters, one guidon, one wagoner, twenty-six drivers, thirty-six cannoneers, and seventy horses. *Provided*, that the President, when he may deem it necessary, may add to the above battery organization one second lieutenant, two artificers, twenty-seven drivers, fifty-nine cannoneers, and seventy-four horses. *And provided further*, that the batteries of the three regiments of Field Artillery herein provided for shall be by the President designated from the batteries now in the Artillery arm of the service having the most distinguished records for service as horse or mounted field batteries.

SEC. 7.—That all promotions in the Artillery arm of the service, created by the provisions of this Act, shall first be filled in general from the officers of Artillery by promotion from the next lower grade by seniority according to length of service as a commissioned officer, subject to the present law governing examination for promotion and retirement; then the President shall select and assign as the officers of the Corps of Artillery, after said general promotion has been made, the officers now in the Artillery arm of the service whose professional qualifications, records, and examinations show them to be best fitted for a scientific Sea-coast Artillery service, and the President shall then assign the remainder of the present officers of the Artillery arm of the service to the regiments of the Field Artillery. *Provided*, that officers now in the Artillery arm of the service may be by the President assigned to the regiments of the Field Artillery upon their own application therefor.

SEC. 8.—That a regiment of Cavalry shall consist of one colonel, one adjutant, one quartermaster, one veterinary surgeon, one sergeant-major, one quartermaster-sergeant, one saddler-sergeant, one farrier-sergeant, two color-sergeants, one chief musician, two principal musicians, one chief trumpeter, two privates, clerks, and two battalions. A battalion of Cavalry shall consist of one lieutenant-colonel, one major, one battalion adjutant, one battalion veterinary surgeon, one battalion sergeant-major, one battalion farrier-sergeant, one battalion trumpeter, one private, clerk, and four troops of cavalry. A troop of Cavalry shall consist of the organization as now provided by law. *Provided*, that when the President may deem it necessary, he may add to the above troop organization one second lieutenant, and he may increase its enlisted strength not to exeeed one first sergeant, one stable and veterinary sergeant, six sergeants, twelve corporals, three artificers, two musicians, one wagoner, and ninety-four privates. *And provided further*, that all original vacancies in the Cavalry or Infantry arms of the service, created by the provisions of this Act, shall be filled by the promotion of the officers now in the respective arms of Cavalry and Infantry from the next lower grade by seniority according to length of service as a commissioned officer; but in no case of promotion to an original vacancy under the provisions of this Act shall any officer who has lost rank by the operation of a sentence of a court-martial or by the action of an examining board or by transfer, by virtue of this Act, regain any rank so lost, but that any officer who has been reinstated by virtue of an Act of Congress with original status of rank, shall for the purposes of this Act only be deemed to have been continuously in the service.

SEC. 9.—That a regiment of Infantry shall consist of one colonel, one adjutant, one quartermaster, one sergeant-major, one quartermaster-sergeant, one chief musician, two principal musicians, one chief trumpeter, two color-sergeants, two privates,

clerks, and three battalions. A battalion of Infantry shall consist of one lieutenant-colonel, one major, one battalion adjutant, one battalion sergeant-major, one battalion trumpeter, one private, clerk, and four companies of infantry. A company of Infantry shall consist of the organization as now provided by law. *Provided*, that when the President may deem it necessary, he may add to the above company organization one second lieutenant, and he may increase the enlisted strength to not exceeding one first sergeant, eight sergeants, sixteen corporals, two musicians, one wagoner, and one hundred and twenty-two privates.

SEC. 10.—That all officers made supernumerary by the provisions of this Act shall be assigned to such duties as the President may direct until they have been absorbed in their respective arms of the service or retired. *Provided*, that second lieutenants of Cavalry or Infantry so rendered supernumerary may, upon their own application, be by the President transferred and assigned to the Corps of Artillery or to the regiments of the Field Artillery arm of the service. *And provided further*, that all original or other vacancies created by this Act shall be subject to the present law governing examination for promotion and retirement, and all laws inconsistent with the provisions of this Act are hereby repealed.

SEC. 11.—That in every battalion serving as a complete unit, the second officer in command shall be the trial officer for his battalion, under the provisions of the Act establishing Summary Courts-Martial, approved September 27, 1890.

SEC. 12.—That all laws, or parts of laws, inconsistent with the provisions of this Act are hereby repealed.

A. D. SCHENCK,
Captain of Artillery.

A STRANGE WOUND: A STORY OF THE REBELLION.

SOME years ago, when stationed in a little town in one of our Western States on college duty, it was my pleasure and delight to spend my leisure hours after drill in the office of a local practicioner, a Dr. Brown by name. He had been a surgeon and medical director of a Western military district during the war, and had, moreover, a wide experience in various capacities. Possessed of great conversational powers, a close observer of men and events, a deep thinker and a great reader, his statements of what he had witnessed not only were of great interest, but remarkable for accuracy and truth as well as detail. One day while in his office the conversation took a professional turn, and he spoke of strange accidents and wounds, and ended by giving me the following tale, which I here relate in as nearly his words as I can now recollect.

"Well, lieutenant, one of the most remarkable wounds I ever came across was connected with a young fellow who belonged to this town. It was in 1862, and I was then attached as surgeon to a regiment of Sanborn's brigade, Hamilton's division, in Rosecrans's Army of the Mississippi. All through that summer and early fall we were pretty scarce of medical officers in that army, and I had plenty of work to do, I can assure you. In September I was appointed an assistant medical director, and had my quarters on the staff of General Hamilton. During the summer we had not moved around much, but when the fall came, our work commenced in earnest. We were at that time in Northern Mississippi, and Grant, who commanded the Western armies then, had an idea of making a forward movement just the moment he felt himself strong enough. By the capture of Forts Donelson and Henry, Island No. 10, and the battle of Shiloh, he had cleared not only Kentucky but all of Northern Mississippi of the Confederates, and also all of Western Tennessee. But in Eastern Tennessee Bragg had a strong force, and threatened to start northward and carry the war to the Ohio border. Now, Grant thought that if Buell could keep Bragg in check he—Grant—could then march southward and compel Bragg to either retreat precipitately or find himself between two large armies, and thus be compelled to fight against great odds. I have always thought that was a mistake of Grant's, for at that time if he had consoli-

dated his forces he could have marched on Vicksburg and Port Royal, which were then without intrenchments or much defense, and have captured them with ease, thus opening the Mississippi and saving the many lives and battles of the year following. At least, that is my opinion, but I am only a doctor, and I suppose my opinion wouldn't count with military men. The forces Grant had in September in his front and opposed to him were Earl Van Dorn's army at and around Vicksburg, and Sterling Price in his direct front in Central Mississippi. The two together numbered about thirty-four thousand men, while Grant had nearly forty thousand, but spread out from Memphis in Tennessee to Bolivar in Mississippi. Now, when Bragg found Buell too strong to pass, he could not break away from him, as Buell would have kept on his heels, and between Buell and Grant he would have been crushed. So he sent for Van Dorn and Price to join him, and in order to keep Grant away he ordered them to make a diversion in his favor by breaking through Grant's lines. Well, now, lieutenant, I am telling you all this in order that you may understand why the battle of Iuka was fought, a battle which to my thinking was one of the most important in the war, though the numbers engaged on either side were very small. You see Grant had his principal depot at Holly Springs, and at Memphis was Sherman with sixteen thousand men, while Ord and Hurlburt held the rest of the line with only about sixteen thousand men. For a while Rosecrans had about eighteen thousand, since the forces at Bolivar were put in his command. After Van Dorn had fortified Vicksburg somewhat he started to make a break to the north, and his first step was to seize the depot at Holly Springs and then appear to march straight for Bragg. But he was a sly old fellow, and instead of marching at once to join Bragg he and Price agreed to form a junction at Iuka, close to Grant's lines, then breaking through his lines, to roll Grant back to the Tennessee and northward, and then join Bragg, by which means they would have been able to whip Buell, and thus cause a loss to the Union forces of all of Tennessee and Kentucky,—an amount of territory which had taken our troops two years nearly to gain. In that case, also, Grant never would have been heard of as a great general. So you can see the importance of Iuka. If it could be held long enough for Grant to get up his forces there in strength, then Van Dorn and Price would necessarily be compelled to retreat, and Bragg would not have his expected reinforcements. Grant penetrated Van Dorn's plan, however, but only two days before the battle, and he also sent forces to seize and hold Iuka, so that it virtually became a race as to who should get there first. Van Dorn made it, and at once fortified himself strongly, thus hoping to beat the forces sent against him in detail. He got in September 18, 1862, and the battle took place the next day.

"Well, now you know pretty well the situation of Iuka, I will tell

you my story. In 1859 Jim and Tom Ainsworth, twin brothers, lived here. They were a mighty handsome couple, both straight, tall, and well formed, and having good, manly faces. Jim was dark,—that is, he had dark eyes and hair,—while Tom had blue eyes and hair a shade lighter than Jim's. They were both of the same height and build, and both were well educated and full of good sense. Well, you know the widow living over on the corner of Third and Washington Streets. She was Mary Carter in those days, and as pretty a picture of health, happiness, and good looks as the sun looks upon. Of course all the young fellows in town were wild after her, but it was some time before she showed a preference for the Ainsworth boys. However, it was a puzzle to know which of the two she liked the best. If she went with Jim one day, the next she was with Tom, and, notwithstanding this shifting, there did not seem to be the slightest jealousy between the two brothers. Sometimes all three would come into church together, and after service was over she would smile as much upon one as the other while she walked home with both. I used to watch them pretty often, and, somehow or other, I fancied it was really Tom she liked the most, though I could not tell why, and she must herself have been unconscious of it.

"Things went on that way through the year, and then came the talk about Breckinridge, Lincoln, and Douglas. The brothers were both Southern, and of course looked at matters from a Southern point of view, and they went about making speeches together and helping along each other all they could. They were both smart lawyers, and having come from Tennessee, of course had no abolition blood in them. Well, fall came, and Lincoln was elected; and although their party was defeated, they seemed to stick closer to each other than ever before, and Mary Carter had not yet made a choice. People used to say she would have to marry them both. But one day in December Jim came into my office with his handsome face all aglow, and a happier and more triumphant light dancing out of his bright eyes than I ever saw before. I knew something had happened, but I was struck all of a heap when he told me that Mary Carter had promised to marry him; I was so sure it was Tom she liked best, and I couldn't help saying, 'But Tom—does he know?' 'Yes, poor Tom! He says he loved her, but I am sure he never loved her as I do, and he'll get over it soon.' After he left I sat musing, and thinking after all how little we know of a woman's ways, when who should come in but Tom. His face was downcast and sad, but he tried to cheer up, and when I spoke to him about the matter he said, 'Yes, I am glad Jim has her. I thought she liked me best, but you see I was mistaken, and I would rather he had her than any one else.' I saw he was hit hard, but was trying to be a man, and a generous one, about it, and somehow I couldn't help but think there was a mistake about it all.

"Well, for the rest of that winter times were pretty active and full for me in this little town, for there were a good many people here who afterwards became red-hot Copperheads, and feeling ran pretty high on all sides. Still, though Mary and the boys were of different political ways of thinking, they all got along finely, and nothing seemed to mar their happiness, and the time was set in spring for Jim's marriage.

"One afternoon late in March the young people of the town to the number of a dozen started down to Elliot's pond for the last skate of the season. I could not go then, but promised to join them in the evening, as it would be moonlight, and they would, besides, light bonfires on the ice near shore. They were to stay out late. It had been pretty warm during the day and the ice had softened a good deal, but towards nightfall it grew cold and froze up tight again. I remember the gloriously beautiful night as though it were yesterday. The moon at its full, the snow—what was left of it—crisp and sparkling under feet, and the sheet of ice glimmering on the pond like a setting of glass.

"As I sauntered down about eight o'clock towards the bridge at the upper end of the pond I heard several screams and shouts for help near by. I rushed down, and there struggling to get up through the ice was Tom Ainsworth, while a rod or two off was Mary Carter entirely helpless. It took me but a moment to break a board off the fence near by and soon have the fellow out, and as he crawled up the bank Mary followed him, very pale and trembling with emotion, and I heard her say something about her darling and that kind of stuff, and the next moment they were kissing each other for all they were worth. I was pretty much astonished, knowing she was engaged to Jim. I stopped that scene by hurrying him off to change his clothes. I hunted up Jim and put Mary in his charge, and then left without joining the skating party, who were all down at the lower end of the pond a mile away.

"You see I wasn't mistaken after all,—she liked Tom best; and when she saw him, as she thought, drowning, it came all of a sudden to her. In a few days it all came out. Tom was willing to do the honorable thing and go away, but Mary took the matter in her own hands, telling Jim how she felt, and that she never could marry him, —Jim.

"A week after the news of Sumter came to us, and I'll never forget Tom's anguish as he came to my room to tell me the whole story. It seems that what Mary told Jim had changed his entire nature. He cursed both Tom and Mary, told them he would be a living thorn in their sides, threatened all sorts of things, and finally ended by leaving town and going South to join the Confederate army. You cannot imagine his rage unless you knew his character, as I was just beginning to learn it, and he was simply unshakable once his mind was made up; and this point you must remember because of the sequel.

"Well, those two boys separated never to meet again till on the battle-field of Iuka, and then under such strange conditions as war alone can bring out. Tom enlisted and joined an Ohio battery, but before going to the front he was married to Mary. I soon joined the army as surgeon, and went through the fighting at Donelson, Henry, Shiloh, the marching and work during the summer of 1862, and finally found myself, as I have told you, at Iuka.

"And now to go back to that battle-field where the two brothers and myself met again. When Grant had learned of Price's attempt on Iuka, he ordered Rosecrans with his two divisions of Hamilton and Stanley to advance on the town by the roads to the west and south of the town, while Ord with nine thousand men was to advance on the north. As Rosy had in his two divisions about nine thousand more, if the whole eighteen thousand men could all get there at the same time they could easily hold the place againt Van Dorn and Price together till Grant had brought up his entire force, if need be.

"Iuka is a beautiful village on the hills, and to its south just outside the town was the triangular plateau on which the battle took place. The base of this triangle was north towards the town, and the point towards the south. The base was about a mile long, but the point lopped off was about a quarter of a mile wide only. Price had fully fourteen thousand men there on the 18th, and he at once caused them to throw up intrenchments on the plateau along the base. Behind them were thick woods, and their position was about as strong as it well could be. Rosecrans did not divide his forces as he was ordered to do, and thus approach by two roads, bringing all his men at once on the field, but scattered them on one road, with Hamilton's division in advance. The skirmishers of this division struck the Confederate pickets about four o'clock on the afternoon of the next day, the 19th, and immediately as fierce a little fight took place as occurred during the entire war. In fact, it is given as a matter of record that no fight had so great a percentage of killed and wounded, for the numbers engaged, as did the battery in Hamilton's division. Look at it, lieutenant, yourself, and you will see as I do that it was one of the most important battles of the war. Ord was far away and did not come up till the next day, when the fight was over; Grant knew nothing of the battle till late that night; while Rosy came on the battle-field but a moment, and then, not thinking it would be much, went to the rear to hurry up Stanley's troops. So Hamilton's division had to fight the battle alone with but four thousand five hundred men. All depended on them, and to Hamilton alone must belong the entire credit of the victory. It was simply a question of holding his place till night should put an end to the battle, for he knew that if he could do that, then by morning light there would be more than enough troops to take care of all the Johnnies. If he could not hold his ground, then Price would

strike Stanley, overthrow him, turn and beat Ord, and thus destroy Grant's army by detail, and all won so far during the war by the Union troops would be lost. Then, making the junction with Van Dorn, the Confederates could have driven Buell over the Ohio and destroyed Grant. So it all depended on Hamilton and his division, and that officer fully realized it, and he fought his men as few officers know how, —always in the front, just when and wherever needed, by his personal example inspiring his men to hold their ground. His horse was killed under him, his clothes perforated with bullets, and every officer on his staff and body-guard but two either killed or wounded. But he held his ground for the three hours of light remaining, and at dark, unable to overcome him, the Confederates withdrew, knowing that the next morning Ord and Rosecrans with the rest of the troops would be up.

"It was a bloody battle, for we lost over two hundred and seventy killed and nearly six hundred wounded out of the four thousand five hundred men engaged, while the rebs lost almost double that out of fourteen thousand men engaged. The key-point of the battle was the ground held by the Ohio battery, in which Tom Ainsworth was now a sergeant. It played the very devil among the rebs, and they determined to have it. So twice they charged it, but both times were driven off. Again they formed columns of attack to storm it, and this time they came on so there was no stopping them. The battery did splendid work just then. The guns seemed alive, so rapidly did they spit out their showers of grape and canister that tore great lanes through the approaching masses. I happened to be near the battery at that time and saw Tom dismounted, himself aiming and firing his gun; and, looking over to the rebs, who should be leading the foremost company of attack but his brother Jim! The very demon was in Jim's eyes as he recognized Tom, and his face lighted up with a terrible expression of hate, and he began, even in that noise and turmoil, to curse him, when his voice was drowned in an explosion. Tom had pulled his lanyard, the last shot fired by the battery, and a shower of grape went right at Jim's company, which laid out Jim and half his men. But notwithstanding, the battery was taken, but soon lost, again taken, and at last abandoned to our men at night-fall.

"Well, that is all about the fight. Hamilton, I think, is the man to whom all the credit is due, as Rosecrans was nowhere about. That night the rebs left in such a hurry that we had to bury their dead and take care of their wounded. I had my hands full, for I was short of assistants. I had ordered a house in town seized and turned into a hospital. It had belonged to a Confederate general officer, and was one of the largest and finest houses in the village, and surrounded by a beautiful shaded lawn. When the house was filled with wounded, and there were still many more coming, I directed a number to be placed outside on the lawn under the shade of trees. As there they

had plenty of fresh air, not cold at that time of the year, they were really as comfortable as in the house.

"Towards evening of the second day after the battle I got my first chance for a little rest, and, taking my pipe and a camp-stool, I went out on the lawn to have a quiet smoke. I sat down as far from the groups of wounded as I well could, though they were so many that was not saying much. At my feet a little way from me was the apparently lifeless body of a Confederate who had been brought in severely wounded, but had died, as was supposed, before the surgeons could get around to him, and the burial-parties were still busy with our own men. Part of his skull had been torn off by a piece of grape-shot or a shell, and the brain or part of it was protruding in a bulbous balloon-shaped mass, confined, it seemed, by a thin tissue. Although covered with blood and dirt, there was something about him that struck my attention, and, bending over him, I discovered it was poor Jim Ainsworth. At first I was glad that he was done for, for I knew he must have been instantly killed, and Tom and his wife could henceforth live in peace. But even while looking at him, it seemed to me that there was the very slightest respiration, and to my surprise I found on examination that there was. 'Impossible,' I said to myself, and I knelt down to watch the closer. A man with the top of his head blown off, the brain protruding, left in the open air for forty-eight hours without attention,—why, such a thing was never heard of. But my senses to the contrary notwithstanding, this man was actually still alive. I took out my watch and counted the respirations, and then set about to help him what little I could, for I felt certain he would die very soon. So, as death was certain, I took from my pocket-case of instruments a small sharp knife and sliced off the protruding part of the brain, and then plastered the skin over the hole in the skull as well as I could. But he still continued to live even after that, and so I injected into him stimulants; and to my great astonishment the number of respirations soon increased and seemed stronger.

"Here was a case to delight any professional man, and perhaps I might be able to keep life in him for a long enough time for his people to come to him. I sent for Tom, and he came the next day. To my unbounded delight, after setting up a tent over the patient and injecting nourishment into him, he seemed to grow stronger, and the idea occurred to me that he might live. From that time the attention of all the surgeons was placed on Jim, and with every care and Tom as a nurse, to make a long story short, he did pull through, though it took some months to do it. Tom could only stay for two weeks, but he knew Jim would live before the end of his furlough.

"I went back to Memphis that fall, and had Jim brought there and put under my especial care in one of our hospitals. Tom joined his battery, and it was not long ere I heard of his promotion. Poor

fellow, he was killed at Vicksburg the next year, and Mary was left a widow with one little child.

"Now for the curious part of the story. I thought, of course, that as Jim recovered he would at least remain an idiot for the rest of his life, and certainly would remember no one nor any of his past life. Not much. He not only knew me, but his mind seemed as bright and clear as formerly, except on one point alone. He asked after Tom and Mary and the old acquaintances up here; he talked of the war, of old times; he cursed the Union cause till I ordered him to be quiet while in a Union hospital and living at the expense of the government and men who had saved his life. But in all his talk of Tom and Mary there was never the slightest malice or bitterness, or reference to the old feud and trouble. At first I thought he wished to avoid the subject, but I soon became convinced it was actually not in his head, and therefore, speaking of it myself to him, I became convinced it was all a blank to him. In other words, what had been the most exciting topic of his life was now a perfect blank. If you ask me how I account for it, I tell you I cannot. Men have often lived days, even years, with bullets and pieces of metal in their brains, but I never heard of a case where a man lived with part of his brain cut or blown away. But he did, and whether or not that part of the brain that I sliced off contained the memory of his love and hate for Mary and Tom is a mystery to me. In every other respect he was himself, and the next spring, when he was exchanged with a number of prisoners, he went off cursing the Union cause and with no thanks for the men who had saved him, but with loving messages for Tom and Mary. He never saw Tom, but was killed towards the close of the war in a little skirmish by a bullet, this time in the brain that was left him. He had then attained the rank of colonel.

"Yes, lieutenant, I've seen many strange wounds, but, take it all in all, that one reached the top notch of them all. I've often wished he might have lived, as then he might have taken poor Tom's place, though that is doubtful, as Mary Ainsworth has had many offers since then, but has always remained faithful to Tom's memory. If this was a story from a novel, and not a true tale, he would have lived and married Mary."

Wm. R. Hamilton,
Lieutenant U.S.A.

ORIGIN AND DEVELOPMENTS OF STEAM NAVIGATION.

(Continued from page 63.)

1840.—THE CUNARD LINE.—Mr. Samuel Cunard was one of the first to foresee the great results that might be achieved by the establishment of steamer communication between the United States and England, and as far back as the year 1830, in his quiet home in Nova Scotia, was thinking over the best means of carrying out this project. In 1838, Mr. Cunard went to England, bent upon putting his idea into operation, and, introduced by Sir James Melville, of the India House, he presented himself to Robert Napier, the eminent marine engineer, and the result of their deliberations was that Mr. Cunard gave Mr. Napier an order to build four steamships for the Atlantic service. The four vessels were to be of 900 tons each, and 300 horse-power. Mr. Napier advised the building of larger vessels, and ultimately it was arranged that the four vessels should each be of 1200 tons burden and 440 horse-power.

The project now assumed a proportion beyond the resurces of a private individual, and Messrs. Cunard and Napier, taking counsel together, hit upon the idea of forming a company. Messrs. Burns, of Glasgow, and Messrs. MacIver, of Liverpool, after having run coasting steamers in keen rivalry for several years, in 1830 amalgamated their undertakings, and this firm of Burns & MacIver was at the time that Mr. Cunard came to England one of the most prosperous shipping companies in Great Britain. The proposal to form an Atlantic steamship company was mooted to Messrs. Burns & MacIver by Mr. Napier, and the outcome was the establishment, in 1839, of the "British and North American Royal Mail Steam-Packet Company." This official title being rather lengthy for hurried utterance, a convenient substitute was found in the simple phrase, "*Cunard Line.*" This phrase has now become familiar as a nautical term from Sandy Hook to the Suez Canal, and from Scotland to the West Indies. Samuel Cunard may be justly regarded as the father of the line, and his enterprising partners, the MacIvers and Burnses, have shown themselves to be quite adequate to the grave responsibilities which they then assumed. About this time the government decided, on grounds of public convenience,

as well as with the view of promoting the extension of steam navigation, to abandon the curious old brigs which had been used for so many years for the conveyance of the mails across the Atlantic and to substitute steam mail-boats. The Admiralty accordingly advertised for tenders for this service, and the Great Western Steam Shipping Company and the newly-formed company of Messrs. Cunard, Burns & MacIver were the only competitors. The tender of the latter firm was accepted, and a seven years' contract was entered into between the Lords of the Admiralty on the one part, and Samuel Cunard, George Burns, and David MacIver on the other part, for the conveyance of mails fortnightly between Liverpool and Halifax, Boston, and Quebec, in consideration of the annual sum of £60,000. One of the conditions of the bargain was that the ships engaged in this service should be of sufficient strength and capacity to be used as troop-ships in case of necessity. The first four ships built under Mr. Napier's direction for the Cunard Company were the "Britannia," the "Acadia," the "Caledonia," and the "Columbia." The "Unicorn" was dispatched from Liverpool on the 16th of May, 1840, to be placed on the branch route to Newfoundland, and made the passage to Boston in nineteen days.

There was considerable excitement in Boston on the afternoon of Tuesday, June 2, 1840, when it was announced that Mr. Cunard's steamship "Unicorn," Captain Douglas, was entering the harbor. The arrival of the first regular steam-packet from Europe had been looked forward to with interest, as marking a most important epoch in the commercial relations of the New World and the Old. The people, young and old, men, women, and children, assembled as the "Unicorn" approached Long Wharf, and the scene on water and land was inspiring and enthusiastic. Cheers rent the air, handkerchiefs and hats were waved, as the "Unicorn" approached. The United States ship-of-the-line "Columbus," moored in the channel, hoisted the English ensign at the fore, and her band played the national tunes of England and the United States, and the revenue cutter "Hamilton," which made a gallant appearance dressed in flags and bunting, fired a salute. For a short time the "Unicorn" "lay to" off the wharf, and as Captain Sturgis, commanding the "Hamilton," stepped on board and tendered a welcome to Captain Douglas, a round of cheers went up from the crowd. Then the "Unicorn" steamed along the water-front and wharves to the vicinity of the navy-yard, and proceeded to the Cunard wharf at East Boston, which had been recently built, and at that time was considered elegant and spacious in every respect. As she passed the revenue cutter she was again saluted, and returned the salute. Salutes were also fired from the wharf. On two lofty flag-staffs erected on the extremity of the wharf British and American ensigns were hoisted. When moored at the wharf many people hastened on board to exchange congratulations with the captain, officers, and passengers.

The "Unicorn" encountered a good deal of rough weather on her voyage, but proved a good and stanch boat. Her machinery worked well, and the passengers were well pleased with their accommodations. She brought out twenty-seven cabin passengers to Halifax, and twenty-four to Boston, and files of London papers to the 15th of May, of Liverpool papers to the 16th, and of Paris papers to the 13th.

The day following her arrival the Boston newspapers were full of copious extracts from the foreign papers which the "Unicorn" brought, and which were appended to the short notice of the important event. Regret was expressed that the political and commercial intelligence by the arrival was not more important, but the heading, "SIXTEEN DAYS LATER FROM EUROPE!" clearly indicated that one of the most important advantages that was anticipated by the opening of steamship communication between Boston and Liverpool was the quicker exchange of news with the Old World.

The arrival of the "Unicorn" was the talk of the city, and the city felt called upon to take proper recognition of so significant an occurrence, and three days later, on Friday, June 5, the city authorities extended a welcome to Samuel Cunard, Jr., a son of Samuel Cunard, and Captain Douglas, commander of the "Unicorn," at Faneuil Hall. The cradle of liberty was beautifully festooned with the flags of the United States and Great Britain, and was otherwise decorated in a very tasteful manner. The city officials and invited guests marched in procession to the hall from the old City Hall, where a banquet had been prepared for about four hundred and fifty persons. Hon. Jonathan Chapman, the Mayor of Boston, acted as the presiding officer and master of ceremonies. In his address of welcome he enlarged upon the vast importance to Boston of steam navigation with Europe in connection with the western railroad. The sentiment which he offered in conclusion was: "Commercial enterprise—it waked up the dark ages; it launched mankind upon the sea of improvement; it guided the bark and spread the sail until a sail is no longer needed to join the two continents together." Mr. Cunard, Jr., was then called up, and made a pleasant response, and the band played "God Save the Queen." Commander Douglas gave a brief account of the voyage, and said the steamers that were being built for the line were to be much larger, and he had reason to believe that the passage would be made in fifteen days. To a toast in honor of England and America, Hon. Mr. Grattan, her Britannic Majesty's consul, responded, and then, the Mayor calling for volunteer toasts, there followed the most sparkling wit and sentiment. Hon. Robert C. Winthrop, then Speaker of the House, made an eloquent speech, and, referring to the dictum of Dr. Dionysius Lardner, that steam navigation across the ocean was physically impossible, said that, to all appearances, it was quite as improbable as the scientific doctor's late elopement to France with Mrs. Heaviside. The

poet Longfellow offered this beautiful sentiment: "Steamships,—the pillar of fire by night and the cloud by day, which guide the wanderer over the sea." The Chevalier de Friederichsthal, attached to the Austrian embassy at Washington, M. Gourand, from Paris, and other distinguished foreigners, John P. Bigelow, John C. Park, Hon. George S. Hillard, Nathaniel Greene, then postmaster of Boston, and others, offered appropriate sentiments, and Governor Everett, who was not present, sent a letter.

The celebration was creditable to the city and the event it commemorated, but nevertheless evoked the criticism of censorious individuals, who evidently did not understand or agree with the old proverb, that the way to a people's heart is through their stomach. In comparison with steamships which now enter Boston and New York, the "Unicorn" was small and insignificant, and yet the arrival of no craft was ever looked forward to with greater anticipation or more genuine pleasure.

With the arrival of the "Unicorn" began the steam traffic between Boston and London and Liverpool, which has since assumed such large proportions. Its coming marked a new era in civilization, and was the harbinger of an immense commercial traffic, and a wonderful rapidity of communication between the New World and the Old. Over forty years have elapsed, and ocean steamers daily arrive, but they excite little interest now.

The "Unicorn" was followed by a coincidence which was entirely unintentional by the departure on the 4th of July from Liverpool of the "Britannia," under command of Lieutenant Woodruff, R.N., for Halifax and Boston, the first regular vessel of the Cunard Line. Liverpool was in a condition of great excitement on the day of the vessel's departure; thousands of people crowded the quays to watch her out, and it was felt that a new era of oceanic intercourse had been begun by this memorable event.

The "Britannia" entered Boston harbor after a run of fourteen days and eight hours. The ship came to her moorings on a Saturday evening, but the inhabitants of Boston thronged the wharves to welcome her, and salvos of artillery were fired in honor of the occasion. Mr. Cunard, Sr., accompanied the vessel, and so great was the enthusiasm created by his enterprise that he received eighteen hundred invitations to dinner within twenty-four hours after his arrival. On the 17th of August the "Acadia" arrived at Boston, after a passage of twelve days and eighteen hours; the shortest passage between the two continents which had been made. Three days later a public banquet was given in honor of the event, at which Hon. Josiah Quincy presided. For seven years these four steamers, re-enforced by two others, carried out the contract with the government. At the end of that time the British government called upon the company to double the number of

its sailings, and every new steamer was, in some respects, an improvement upon its predecessors.

Charles Dickens crossed in the "Britannia," and one of the most amusing chapters of his "American Notes" is devoted to the voyage.

Some readers may recall how comically he contrasts his actual experiences with his anticipations of what the ship would be like, his imagination having been fed previous to his going on board by the lithographic pictures of the line,—what "an utterly impracticable, thoroughly hopeless, and profoundly preposterous box" he found his state-room to be; and how he describes the saloon as "a long, narrow apartment, not unlike a gigantic hearse with windows in the sides; having at the upper end a melancholy stone, while on either side, extending down its whole dreary length, was a long, long table, over each of which a rack, fixed to the low roof and stuck full of drinking-glasses and cruet-stands, hinted dismally at rolling seas and heavy weather."

A notable event in the history of the "Britannia," the pioneer ship of the Cunard Line, which became a great favorite in Boston, was the cutting a channel for ten miles in length, in Boston harbor, in 1844, through the ice, in order that she might sail at the appointed time. "Those who remember the month of February, 1844, will recall one of the most astonishingly cold periods of the last fifty years. The first of the month was agreeable enough for winter, but three or four days of intense cold came upon us about the middle of it. Ice rapidly formed in the harbor, and soon the whole distance from the wharves to Fort Warren was frozen over. Men, women, and children enjoyed the novel experience of walking all over the harbor. Skaters went to the outermost edge of the ice. Horses and sleighs entered on the ice-field from South Boston. Booths were established for the supply of creature comforts, bonfires lighted to warm the hands and feet of pedestrians, the earliest ice-craft with extended sail was seen skimming over the smooth surface, and the days and nights in the harbor partook of a carnival. But it was a serious matter to the agent of the Cunard Line, who had the steamer 'Britannia' in port, and she was under contract to carry the mails, and must somehow get out to sea. Bostonians had some interest in the matter, too, for the line had but recently been established, and here was a fulfillment of the prophecy of the jealous New Yorkers, who had said it was an ice-locked harbor in winter. With characteristic energy and public spirit the merchants met at the Exchange one day, as the time for the sailing of the steamer neared, and no south wind had come to loosen the frost's hold on the waters, and resolved upon the undertaking of cutting a channel for the steamer from her dock to the open bay,—a pathway of over ten miles. Mr. John Hill, with some experience in ice-cutting, was selected for the job, but it proved too much for him. At this juncture Mr. Jacob Hittinger,

of Gage, Hittinger & Co., large ice-cutters upon Spy Pond, in West Cambridge, contracted with the merchants to liberate the steamer. The task was accomplished, and the 'Britannia,' on her appointed sailing day, moved majestically through the canal, a hundred feet wide, to the open ocean, amid firing of cannon and the cheering of thousands, the multitudes not only lining all the wharves, but flocking upon the solid ice in countless numbers. Probably never again will we witness the spectacle of an ocean steamer moving down the harbor accompanied by thousands of people running or skating by her side. The tug-boats which have come into service by scores have rendered the freezing of the harbor practically impossible, as on the slightest indication of ice they are abroad to break it up. Gage, Hittinger & Co. received ten thousand dollars for this immense job, which actually cost them twenty thousand dollars, but they enjoyed the satisfaction of being recognized as enterprising and successful men in the venture."[1]

The Cunard steamers in the transatlantic trade, 1850, were:

	Tons	H. P.		Tons	H. P.
Caledonia	1250	500	Niagara	1800	700
Hibernia	1400	550	Europa	1800	700
Cambria	1400	550	Asia	2250	800
America	1800	700	Africa	2250	800
Canada	1800	700			

All these were paddle-wheel steamships, and the general length of the six largest was 275 to 300 feet, and beam from 40 to 42 feet. Their cylinders were 90 inches in diameter, and the length of stroke of the piston of the 700 horse-power engines was 8 feet, and of the 800 horse-power engines 9 feet. The diameter of the paddle-wheels was 32 and 36 feet.

In 1852 the Cunard Company established steam communication between Liverpool and the Mediterranean ports. Their steamers have also performed the mail service between Glasgow, Greenock, and Belfast. They have had lines of steamers plying between Liverpool and Glasgow and Glasgow and Londonderry, and they likewise have had steamers carrying the mails between Halifax, Bermuda, and St. Thomas.

Prior to 1852 the fleet of the Cunard Company consisted entirely of paddle-wheel wooden steamships. In that year the "Andes" and "Alps," both iron vessels *with screws*, were added to the long "catalogue of the ships." These were afterwards taken by the British government for transport service in the Crimea, and were followed in 1854 and 1855 by the "Jura" and "Ætna," iron screws, and both for the Atlantic trade. In 1855, with the "Persia," the experiment was tried of building an *iron* paddle steamer.

1855.—On the 3d of March the steamship "Persia," the first *iron*

[1] *Commonwealth* newspaper.

paddle-wheel ship built for the Cunard Company, was launched from the building-yard of Messrs. Robert Napier & Sons, at Govan. She was the largest steamship then afloat in the world, exceeding in length, strength, tonnage, and steam-power the "Great Britain" or the "Himalaya," and by twelve hundred tons the internal capacity of the largest of the Cunard liners of that time. Her chief proportions were as follows:

Length from figure-head to taffrail	390 feet.
Length in the water	360 "
Breadth of the hull	45 "
Breadth all over	71 "
Depth	32 "

The lines of beauty had been so well worked out in the "Persia" that her appearance was singularly graceful and light. Yet the mighty fabric, so beautiful as a whole, was made up of innumerable pieces of metal, welded, jointed, and riveted into each other with exceeding deftness. The keel consisted of several bars of iron about thirty-five feet in length, each joined by long scarfs, and as a whole thirteen inches deep by four and a half inches thick. The framing was constructed in a peculiar manner to secure the greatest amount of strength. The iron stern-post was thirteen inches in breadth by five inches in thickness, carrying the rudder, the stack of which was eight inches in diameter. The framing of the ship was very heavy. The space between each frame was only ten inches, and the powerful frames or ribs were themselves ten inches deep, with double angle-irons at the outer and inner edges.

The plates, or outer planking of the ship, were laid alternately, so that one added strength to the other, forming a whole of wonderful compactness and solidity. The keel-plates were eleven-sixteenths of an inch in thickness; at the bottom of the ship the plates were fifteen-sixteenths of an inch in thickness; from that section to the load water-line they were three-fourths of an inch; and above that they were eleven-sixteenths of an inch in thickness. The plates round the gunwales were seven-eighths of an inch in thickness.

She had seven water-tight compartments. The goods were to be stowed in two of the divisions. The goods store-rooms or tanks were placed in the centre line of the ship, with the coal-bunkers on each side of them. The vessel was constructed with a double bottom under the goods-chambers, so that if the outer were beat in, the inner would protect the cargo dry and intact. The chambers were water-tight, and in the event of accident to the hull the tanks would of themselves float the ship.

She was followed in 1862 by the "Scotia," also built of iron, and

of still larger dimensions.[2] It soon became apparent that iron was the best material for ocean steamers, and that the screw furnished the best means of propelling them, and in all subsequent additions to the fleet these truths have been recognized and acted upon.

Between 1840 (when the Cunard Company, strictly so-called, came into existence) and 1876 it had built one hundred and twenty-two steamers, and owned in that year a navy of forty-nine vessels,—viz., twenty-four in the Atlantic mail service, twelve in the Mediterranean and Havre line, five plying between Glasgow and Belfast, three between Liverpool and Glasgow, three between Halifax and Bermuda, and two between Glasgow and Derry. The money value of the Atlantic mail boats alone was estimated at between fifteen million and twenty million dollars, and it would not be an exaggeration to state that the value of the entire fleet was double the amount. According to an official statement, made by the company about this time, a Cunard transatlantic steamer had sailed at first once a week, subsequently twice a week, and latterly three times a week from Liverpool, and another from New York or Boston, making over four thousand voyages across the Atlantic, an aggregate distance of over twelve million miles, carrying more than two million passengers without the loss of a life or even of a single letter.

Few people suspect that at least three of the old favorites are still running from New York to Europe; for how could they recognize the "Russia," enlarged to nearly twice her former size in the "Waesland," the "Java," in the "Zealand," or the "Algeria," which disappeared so quietly as hardly to be missed in the "Pennland?"

[2] In the summer of 1879 the "Scotia" was bought by the British Telegraph Construction and Maintenance Company. Her paddles were removed and new engines and twin screws placed in her, and she sailed from the Mersey for Singapore. The "Scotia" was the last and grandest of the paddle-wheel vessels added to the Cunard fleet: a strong ship, of great engine power, and in her day the most magnificent vessel engaged in the transatlantic trade between Liverpool and New York. But times changed with the "Scotia," as they do with all other things mundane. Her engines, though still of unrivaled power, consumed an enormous amount of coal, and coal was not only costly, but its storage filled an undue proportion of the available space. Science had introduced a new order of things in marine engines. The cumbrous paddles were superseded by the more compact screw, and the compound system of engines allowed of an equal power being realized at a far less expenditure of fuel. These improvements decided the fate of the "Scotia." We may well suppose that it was not without a severe qualm that the Cunard Company came to the resolution that their splendid "Scotia," while almost a new ship, must give way to the new order of things. Screw steamers like the "Russia" and the "Scythia" were doing as good work under more favorable conditions, and the "Scotia" was withdrawn from the service. She was sold, and for a long time lay at Birkenhead, superannuated and almost neglected. And it should be borne in mind by those who criticise the deterioration of our navy that the "Scotia" was built after the commencement of our Civil War as a specimen of the finest steamship afloat, and that three years ago, only seventeen years after her construction, she was sold, having been for some time superannuated.

It was said that the steamship "Russia," the last vessel built by the Cunard Company under a subsidy contract, cost more by £30,000 than she would have cost if built for an independent service.

For ten years in the early history of the Cunard Company each vessel carried a naval officer as a representative of the Admiralty (in those days the mail contracts were made by the Lords of the Admiralty, instead of by the postmaster-general, as now), who was clothed with power to act in certain emergencies, and who had control of the royal mails. The company, after a time, paid a round sum to be relieved of the presence of these officials. At a later period, representatives of the post-office were placed on board, who sorted and made up the mails on the voyage.

THE FLEET OF THE CUNARD LINE, 1882.

Name.	Built.	Tonnage.		Name.	Built.	Tonnage.		Name.	Built.	Tonnage.	
		Gross.	Net.			Gross.	Net.			Gross.	Net.
Aleppo . .	1865	2050	1398	Malta† . . .	1865	1132	1149	Scythia* . .	1874	4557	2923
Atlas† . . .	1860	2393	1552	Marathon† .	1860	2403	1552	Servia* . .	1881	8500	6500
Batavia . .	1870	2553	1627	Morocco . .	1861	1855	1193	Sidon† . . .	1861	1853	1193
Bothnia* .	1870	4536	2923	Olympus .	1860	2415	1585	Tarifa† . . .	1865	2058	1399
Catalonia* .	. . .	. . .	. . .	Palmyra . .	1866	2043	1382	Trinidad .	1872	1899	1228
Demerara‡	1872	1904	1231	Parthia* . .	1870	3166	2033	Aurania . .	bldg	. . .	. . .
Gallia* . .	. . .	. . .	. . .	Samaria† .	1870	2605	1694	Cephalonia§	1882	5600	4350
Kedar‡ . .	1860	1875	1215	Saragossa .	1874	2262	1429	Pavonia† .	1882	. . .	. . .

* Between New York and Liverpool. † Between Boston and Liverpool.
‡ Mediterranean service. § Arrived at Boston on first trip, September 4, 1882.

The transatlantic steamers of this line sail every Wednesday and Saturday from New York and from Boston for Liverpool, and as often from Liverpool for each of those ports.

The report of the directors of the lately-formed Cunard Stock Company shows the net profits of the year 1880 amounted to one hundred and ninety-three thousand eight hundred and eleven pounds.

The three steamers recently built are of steel. The "Aurania" is of seven thousand tons, and has engines of eight thousand five hundred horse-power; and the "Pavonia," and her sister ship, the "Cephalonia," are of five thousand six hundred tons. The "Servia," one of the latest additions to the Cunard Line, arrived at New York at 11 A.M., December 8, 1881. She left Queenstown at 10 A.M., November 28, and, taking into consideration the boisterous weather she encountered, the passage was a remarkably quick one. Her purser, Mr. William Field, said that he never experienced such a rough time, though he has held his present position for twenty-five years, having served in every ship on the line, and made over four hundred passages. No damage whatever occurred to the big craft.

The "Servia" brought one hundred and seventy-one cabin passengers and one hundred and fifty-five in the steerage. In point of size the "Servia" is only exceeded by the "Great Eastern," while, as regards engine-power, it is claimed that she surpasses anything afloat.

Mr. John Burns, of the Cunard Company, in a communication to the London *Times* when the "Servia" was on the stocks, said, concerning her,—

"This vessel has been designed, after lengthened consideration, to meet the requirements of our traditional service, and we have adopted in every detail of the ship and engines the most advanced scientific improvements compatible with the safe working of so great a vessel. Among the important matters into which we have crucially inquired has been that of the employment of steel instead of iron, and after a practical and thorough examination into the merits of both materials we have adopted steel for the hull and boilers, but under a provision so stringent that every plate, before acceptance, will undergo a severe and rigid test by a qualified surveyor appointed and stationed at the steel manufactory for that special purpose, and that the manipulation of the steel by the builders shall be subject to an equally careful supervision by qualified engineers of our own appointment. The steel is to be made on the Siemens-Martin process, and all rivets as well as plates throughout the ship are to be of steel."

The substitution of steel for iron has not only improved the steamship, steel being more ductile and stronger than iron, but it has a great advantage economically. The "Servia" weighs six hundred and twenty tons less than she would have done if she had been built equally strong with iron; and of course she has so much greater carrying capacity.

The "Servia's" dimensions are: Length, 533 feet; breadth, 52 feet; depth, 44 feet 9 inches; gross tonnage, 8500 tons. A better idea, perhaps, of the vast size of the vessel may be gathered from the following facts: Her cargo capacity is 6500 tons, with 1800 tons of coal and 1000 tons of water ballast, the vessel having a double bottom, on the longitudinal bracket system. The anchor davits are 8 inches and the chain-cable pipe 22 inches in diameter. The propeller-shaft weighs 26½ tons, and the propeller, boss, and blades are 38 tons in weight. The machinery consists of three cylinder compound surface condensing engines, one cylinder being 72 inches and two 100 inches in diameter, with a stroke of piston of 6 feet 6 inches. It is anticipated that the indicated horse-power will amount to 10,500. There are in all seven boilers, six of which are double- and one single-ended, and all are made of steel, with corrugated furnaces, the total number of furnaces being 39.

Practically, the "Servia" is a five-decker, as she is built with four decks and a promenade. The promenade, which is reserved for the passengers, is very large and spacious. On the fore part of it are the steam steering-gear and house, the captain's room, and flying bridge. On the upper deck forward is the forecastle, with accommodations for the crew, and lavatories and bath-rooms for steerage passengers, while

aft are the light-towers for signaling the admiralty lights, with the lookout bridge on the top. Near the midship-house are the captain's and officers' sleeping-cabins. Next to the engine sky-light is the smoking-room, which can be entered from the deck or from the cabins below. It is unusually large for a smoking-room, being 30 feet long by 22 feet wide. Near the after-deck house is the ladies' drawing-room, to which access can be obtained either from the music-room or from the deck. Abaft of this, and in the upper end of the upper deck, is the music-room, which is 50 feet by 22 feet in dimensions, and which is fitted up in a handsome manner, with polished wood panelings. Immediately abaft of the music-room is the grand staircase leading to the main saloon and the cabins below on the main and lower decks. At the foot of the stair leading to the saloon, and also in the cabins, the panelings are of Hungarian ash and maple wood. The saloon is very large, being 74 feet long by 49 feet wide, with sitting accommodation for 350 persons, while the clear height under the beams is 8 feet 6 inches. The sides are all in fancy wood, with beautifully polished inlaid panels. All the upholstery of the saloon is of morocco leather. Right forward of the after-deck are the baths, lavatories, and state-rooms. The total number of state-rooms is 168, and the vessel has accommodation for 450 first-class and 600 steerage passengers, besides a crew of 200 officers and men. For two-thirds of its entire length the lower deck is fitted up with first-class state-rooms. The ship is divided into nine water-tight bulkheads. There are in all twelve boats equipped as life-boats.

The arrangement of the water-tight doors in the engine- and boiler-spaces is admirable, as in case of accident they can be shut from the upper deck in two seconds or so. The keel is built in five layers, having a total thickness of six and three-quarter inches. The upper deck, which is of steel, has a covering of yellow pine; the main deck, which is also of steel, is covered with teak, and the lower deck, again of steel, is shielded with teak above the engine- and boiler-spaces. The deck-houses and deck-fittings, which in unusually heavy weather might otherwise be liable to be carried away, are made of iron and steel, and are riveted to the decks underneath. The "Servia" is built with a double bottom, so that in the event of her running on the rocks and having a hole knocked in her hull, she would still be perfectly safe as long as the inner skin remained intact. She has three masts of the special Cunard rig, and they carry a good spread of canvas to assist in propelling her. She is fitted with steam stearing-gear, steam winches, and a second steering-gear, independent of the steam apparatus. The latest scientific improvements have been adopted in all parts of the vessel; steam is used for warming the cabins and saloons, and every passage has its own seriers of ventilators.

On her trial trip she repeatedly attained a speed of 20½ miles an

hour. This is equivalent to about 18 knots. During the trial she carried 2500 tons of dead weight aboard.

In former days it was held that the ratio of indicated horse-power in the engines to the tons burden of the vessel should be as one to four. In the "Great Eastern," with her propeller and paddle-wheels the ratio was as one to fourteen. But in the "Servia" and other new boats the number of indicated horse-power is greater than the number of tons burden. The engines are exceedingly powerful, even when the size of the vessel is considered; and hence the frame-work of the hull has to be made with great rigidity and with the utmost care. The increase in speed attained by these changes can only be demonstrated by experience; but it seems to be the opinion of many nautical men that, with such heavy engines, the jar given to hull will make the "Servia" and vessels of her class less comfortable as passenger crafts than some of the older and smaller transatlantic steamers.

In 1859 in recognition of the great service he had rendered to the United Kingdom, the queen, upon the recommendation of Lord Palmerston, conferred a baronetcy upon Mr. Samuel Cunard. He was succeeded, on his death, both in his business and his title, by his son Edward, who continued his connection with the company up to the time of his decease, in 1869, when the title devolved upon the present baronet, Sir Bache Edward Cunard. Sir Bache, who is a great polo player and intimate of the Prince of Wales, was born in 1851, and has not been connected with the undertaking originated by his distinguished grandfather. The only member of the Cunard family now associated with the Cunard steamship enterprise is Mr. William Cunard, the second son of Sir Samuel, and uncle of the present baronet.

Mr. David MacIver died a few years after the formation of the line. Sir Samuel and his son, Sir Edward, died later. George and James Burns retired from business in favor of two sons of the former, John and James Cleland.

Until the year 1868 the management of the Cunard Company was carried on, as it were, in three divisions. There were the Messrs. MacIver, at Liverpool, the Messrs. Burns, at Glasgow, and the Messrs. Cunard, in America. Together they constituted the Cunard Company, but they conducted the business as three distinct undertakings. In 1863 a fresh deed of partnership was executed, by which Messrs. Cunard, Burns, and MacIver became the sole partners, as well as joint managers. This arrangement continued in force until May, 1878, when the concern was merged into a limited liability company, with a capital of $2,000,000. Of this, $1,200,000 was taken by Messrs. Cunard, Burns, and MacIver as part payment for the property and business which they transferred to the new company. No shares were offered to the public. By a rule of the London Stock Exchange, however, two-thirds of the capital of any undertaking quoted in their

official list must be allotted to the public. To meet this requirement, Messrs. Cunard, Burns, and MacIver consented to relinquish £533,340 of their capital for the benefit of the public. This was done in March, 1880, and the demand for shares thrown open was enormously in excess of what was available.

Mr. William Cunard, one of the managing directors of the company in 1881, is the second son of Sir Samuel, who founded the company, and was created a baronet by the queen for his enterprise in transatlantic steam navigation. For many years the Cunard Company received a subsidy of £176,340 per annum under its mail contracts, but for some years past the only compensation the line has received for carrying the mails has been one-third of the actual postage paid. The steamships of the company are, however, as formerly, inspected on the day before sailing from England by officers of the Board of Trade. When first established they carried an officer of the Royal Navy as mail agent; but that practice has been discontinued.

It is remarkable to note the extraordinary progress achieved since the "Britannia" made her first voyage in 1840. Measuring 1139 tons, she had capacity for but 225 tons of cargo, whereas the "Bothnia," of 4335 tons, built in 1874, takes 3000 tons of cargo, or nearly fourteen times as much, though only four times larger. The "Britannia" carried ninety passengers, whereas the "Bothnia" can carry three hundred and forty-nine, or close upon four times as many. The former steamed eight and a half knots, the latter steams thirteen knots an hour, or more than half as quick again, with less than half the coal per indicated horse-power per hour, and at about the same quantity of fuel for the actual number of miles run. The "Persia," the finest vessel afloat in her day, took six tons of coal to carry a ton of freight across the Atlantic. The "Arizona," double the size of the "Persia," takes only a fifth of a ton.

The "Cephalonia" was launched in the Mersey May, 1882, and is the largest steamer ever built on that river. Her dimensions are as follows: Length on upper deck, 440 feet; length between perpendiculars, 430 feet; beam, 46 feet; depth in hold, 34 feet 6 inches; tonnage, B. M., 4350 tons; gross register, about 5600 tons. The "Cephalonia" is constructed of iron, and is fitted to carry upward of one hundred first-class passengers, and one thousand, five hundred steerage. She has four decks, three of which are of iron, covered with wood-planking. Her rig is that of a barque. The masts are of steel, the fore and main being in one piece up to the top-mast head, and mizzen in one piece its whole length. The engines are two thousand five hundred horse-power, and have two cylinders, the high pressure one being fifty-two inches diameter, and the low pressure ninety-three inches diameter, with a stroke piston of five feet six inches. The propeller is four-flanged, and of the best steel. The boilers are six in number.

The appliances for discharging cargo include five very powerful steam winches. The capstans and the steering apparatus are also worked by steam.

The "Cephalonia" has several unique features, distinguishing her from other large ocean steamers. One is that of Sir George Thompson's sounding machinery, by which soundings can be made to a depth of sixty fathoms while the vessel is going at the rate of fifteen miles an hour. She has also appliances for steering, both by steam and by hand, there being two for the former and three for the latter. She carries six officers, eight engineers, and two electricians. The "Cephalonia" excels in the completeness of the electric light system, which, in some respects, is in advance of anything yet used on the Atlantic. There are three hundred and forty of the Swan incandescent lamps on board, ready for use in the day as well as night. They are so contrived that the light falls within the chimney of a regular oil-lamp, which can be used in case of accident to the former. A pair of powerful engines and one of Dr. Siemens's electric machines are steadily employed under the management of an electrician for the production of the light.

She left Liverpool on her first trip August 24, 1882, at 3 P.M., and arrived at Boston, September 4, bringing 141 cabin and 406 steerage passengers. No fair wind was had during the whole trip, and in consequence the "Cephalonia" was not able to utilize her square sails, but with the exception of one or two stoppages to attend to the requirements of the machinery, no delay was encountered. The speed attained during the trip was fourteen knots.

The new Cunard steamship "Pavonia," Captain McKay, arrived at Boston, October 30, 1882, from Liverpool. The "Pavonia" is a sister ship to the "Cephalonia." Her length is 430 feet, breadth 46 feet, and depth 47 feet. There are accommodations for over 200 cabin and 1000 steerage passengers. The saloon extends across the vessel, and the smoking-room is situated on the promenade deck. The ladies' cabin, which is a marvel of beauty, is situated on the main deck. The vessel has eleven water-tight compartments, with three solid iron decks. A special feature in the construction of this steamer is the strength and number of her transverse water-tight bulkheads, the eleven compartments being divided into smaller ones. Besides the steam steering-gear, which is located aft, but is worked from the bridge, there is a powerful screw-gear and an arrangement for working the vessel with ropes in the event of any accident. The forecastle, which is 92 feet long, contains storage-room for the passengers and accommodation for the seamen. Back of the forecastle, in the after deck, there is a pleasant promenade to the turtle back, the deck being clear on both sides. The first-class state-rooms are on the main deck, and their average size is about 11 x 6 feet. Each state-room is provided with an electric light which can be regulated by the occupant. The engines are of the

two-cylinder, inverted, vertical type, being 53 and 92 inches in diameter, and having 5 feet 6 inches stroke. The "Pavonia" was built by Messrs. J. & G. Thomson, of Glasgow, and is intended to go at the rate of fourteen knots per hour at sea.

The "Gallia's" model received a first-prize gold medal at the Paris Exhibition. She was barque-rigged, and built after the general design of the "Scythia" and "Bothnia," but she is longer and wider than either. Her length is 450 feet over all, her molded width 44 feet, and her depth of hold 36 feet, with a measurement capacity of 4809 tons. Her machinery includes the latest improvements. She has three compound direct-acting cylinder engines, two of them being 84 inches in diameter, and the third 61 inches; the piston-stroke being 60 inches, affording a nominal force of 700 horse-power, which, however, can be increased, should necessity demand, to over 3000 horse-power. She has state-room accommodations for 480 first-class passengers, and has equally large accommodation for steerage passengers. The cabin fittings and arrangements, and the state-rooms, are unusually fine. The principal dining-saloon is on the spar deck, and is lighted by a series of top and side lights. It is floored with oak parquetry of Belgian manufacture, and the walls are inlaid with Japenese paneling upon a ground of red jasper, with gold tracery. There are sideboards and mirrors, a piano, and a large library. The second dining-saloon (on the main deck) is furnished with taste, and both have revolving sofa chairs at the tables. On the upper deck there is a "Ladies' boudoir," and a "Ladies' cabin" on the spar deck, the latter being paneled with Brazilian onyx, and richly upholstered in blue. A commodious and beautifully fitted smoking-room for gentlemen is on the main deck. The state-rooms and berths are large, well ventilated, and fitted with many improvements, including stationary wash-basins and steam-heaters of a new pattern. They all communicate by means of pneumatic bells in the steward's department. The vessel carries a crew of one hundred and thirty men.

With a history extending over forty busy years, with a fleet that has comprised from the beginning one hundred and twenty-six large steamers, with a constant floating population of many thousands to protect, and with all the dangers of wind and wave to battle against, it might naturally be supposed that the Cunard Company would have a long list of disastrous accidents, shipwrecks, and losses to recount; but it is the boast of the proprietors of the Cunard Line that from 1840 down to the present time not one of their passengers has lost his life by accident in any of the thousands of voyages that have been made across the Atlantic in their ships, and the few accidents which have happened to the machinery or otherwise have only resulted in temporary delays, without endangering the safety of the passengers. Many things have combined to secure to the Cunard ships this astonish-

ing immunity from disaster. In the first place, the company have always insisted on having their vessels built of the best possible materials; they have enjoined the most thorough workmanship; they have kept their vessels under such careful supervision as to insure the discovery of the slightest defect in strength or seaworthiness, and they have never allowed a steamer to start on a voyage unless they have been satisfied of its being complete, perfect, and efficient. In the next place, they have chalked out separate routes for outward bound and homeward bound steamers, somewhat apart from the direct course; and although by adopting this plan they may have lengthened their voyages by a few hours, this has been more than atoned for by the increased sense of security which has been induced. The care and skill exercised by the navigation of the Cunard Line of steamers have been amply rewarded by the prosperity and success which have attended them.

From the year 1840 down to the present time (November, 1882) the company have built 126 steamers, and their entire fleet now comprises 31 steamships, having an aggregate tonnage of 87,604 tons and 55,445 effective horse-power. The company employ, one way and another, from 10,000 to 12,000 men. Upward of 1500 are constantly engaged in the work of loading and unloading, and nearly that number in fitting and repairing vessels. They have always from 7000 to 8000 sailors employed, and these men may be regarded as among the finest men to be found in the whole merchant service.

1840.—THE PENINSULAR AND ORIENTAL STEAM NAVIGATION COMPANY.—The career of this company, the first to undertake to convey the mails overland to the East, is interesting. During the earlier part of its career, by agreeing to carry the Peninsular mails for a sum considerably less than the Admiralty packets, with a speed and regularity hitherto unknown, it conferred an undoubted boon upon the public.

In 1815 Mr. Brodie McGhee Wilcox, a young man without influence and but limited pecuniary means, commenced business in London as a ship broker and commission merchant. He soon after engaged a youth from the Orkney Islands, Arthur Anderson, as his clerk, who became his partner in 1825, under the title of Wilcox & Anderson. In 1834 the Dublin and London Steam-Packet Company chartered the steamer "Royal Tar" to Dom Pedro through the agency of the firm. Soon afterwards the Spanish minister in London induced Messrs. Bourne, of Dublin, to put on a line of steamers between London and the Peninsula, for which Wilcox & Anderson were appointed agents. A small company was formed to carry out this undertaking. Previously to September, 1837, the Peninsular mails were conveyed by sailing-packets, which left Falmouth, England, for Lisbon every week, "wind and weather permitting." The Peninsular Company of Steam-Packets, some little time established, on the 29th of

August, 1837, contracted to convey the Peninsular mails for £29,600 per annum, subsequently reduced to £20,500 per annum. This service may be considered the nucleus of the great company which now conveys the mails to all parts of the Eastern world. The "Iberia," the first steamer dispatched with the Peninsular mails, sailed in September, 1837.

The mails were conveyed to and from India up to September, 1840, by steamers plying monthly between Bombay and Suez, and thence by British government steamers from Alexandria to Gibraltar, where they received the mails brought out by the Peninsular Company from England. In 1839 the British government entered into a convention with the French government for sending letters to and from India through France by way of Marseilles. The irregularities that ensued caused the British government to apply to the managers of the Peninsular Company to run a line of superior steamers direct from England to Alexandria, and *vice versa*, touching only at Gibraltar and Malta. The vessels approved by the Admiralty were the "Oriental," of 1600 tons and 450 horse-power, and the "Great Liverpool," of 1540 tons and 464 horse-power, which was originally intended for the transatlantic service. These were now dispatched with the mails from England to Alexandria, Egypt, thus combining the two mail services and constituting the Peninsular and *Oriental* Steam Navigation Company. In 1842 the East India Company contracted with the Peninsular Company to establish a line of steamers between Calcutta and Suez, and September 24, 1842, its new ship, "Hindostan," of 1800 tons and 520 horse-power, was sent from Southampton to open a line between Calcutta, Madras, Ceylon, and Suez. The government went into another contract with the company for a monthly service from Ceylon to Penang, Singapore, and Hong-Kong, and in 1854 the company undertook another line between Bombay and Suez. They next extended a line between India and the Australian colonies. All these lines were heavily subsidized. The urgent requirements of government for conveying troops to the Black Sea and the Baltic on the outbreak of the Crimean war obliged the company, towards the close of 1854, to discontinue the line to Australia and to reduce the Bombay and China service from a fortnightly to a monthly line. During the Crimean war this company had eleven of their steamers, measuring 18,000 tons, in the transport service, which conveyed during the continuance of hostilities 1800 officers, 60,000 men, and 15,000 horses. The "Himalaya," the largest vessel of the line at this time, was 340 feet in length, 44½ feet width of beam, and her engines were 2050 indicated horse-power. She was 3540 tons, old measurement, and cost £132,000 when complete for sea.

Thus, step by step, the company advanced, until we learn from its annual report ending September 30, 1874, its paid-up capital at that

time amounted to £2,700,000 and £800,000 debenture stock, and that it was the intention during the year to increase it up to £4,300,000, of which £600,000 would remain unpaid. Of this capital, £3,757,000 consisted of stock in ships; £221,000 of freehold and leasehold property and docks and premises in England, Calcutta, Bombay, Singapore, Hong-Kong, and other stations; and £413,000 in coal and naval victualing stores. Its fleet at the same time consisted of 50 sea-going steamers, measuring 122,000 tons, and of 22,000 horse-power,—thirty-four being employed in the Mediterranean, Adriatic, India, and China services; four in the Australian service between Ceylon, Melbourne, and Sydney; five in the China and Japan local services; two used as cargo vessels; five undergoing repairs and in reserve. The company also possessed twelve steam-tugs and three cargo- and coal-hulks, and gave permanent employment to 12,600 persons, exclusive of coal laborers and coolies on shore; about 90,000 tons of coal were usually kept constantly in stock at its coaling-stations. This was a navy which many governments might be proud to own.

The iron screw steamship "Khedive," of this line, built in 1873, is of the following dimensions: Length, 380 feet; breadth, 42 feet; depth, 36 feet. Her builders' measurement is 3329 tons; her gross register, 3742 tons; and her net register, 2092 tons. She is fitted to accommodate with the space and style now required for Eastern travel 164 first-class and 53 second-class passengers. She has store-rooms to hold 380 tons; rooms for mails and baggage to contain 142 tons; bunkers to hold 846 tons of coal; and holds which can receive 2003 tons of cargo, of 50 feet to the ton. The contract price for the ship fitted complete for sea was £110,000. Her engines are compound, vertical, direct-acting, of 600 nominal horse-power, with 4 feet 6 inches length of stroke. The diameter of her cylinders, 69 and 96 inches respectively; and of her four-bladed screw, 17 feet 6 inches; its pitch being 22 feet 6 inches and 24 feet. She has 4 boilers and 16 furnaces. The five-bar surface is 320 square feet, and the heating and condensing surface 11,720 and 6059 square feet respectively. The loaded pressure is 55 pounds on her boilers.

We have nothing in ancient times to compare with this model modern steamship, with her long, low hull, unless it be the rowing-galley, and to propel a vessel of the size and weight of the "Khedive" at the rate of four miles an hour through the smoothest water would require at least two thousand rowers, while the average speed of the "Khedive" on a voyage from Alexandria to Southampton, a distance of 2982 miles, was ten knots, and on the return voyage eleven knots or nautical miles per hour.

A new contract has been made with the Peninsular and Oriental Steam Navigation Company for the conveyance of the mails to India and China, for a period of eight years from the 1st of February, 1880,

at the reduced subsidy of £370,000, being £60,000 per annum less than the sum paid under the then expiring contract. This payment may be further reduced at the option of the post-office authorities by £10,000 per annum, in consideration of the penalties not being made absolute. In this case, also, simultaneously with a reduction of cost, an increase of speed has been secured. The company is liable to a penalty of £100 for every twelve hours in excess of the contract time between Brindisi and Bombay on its outward voyages, and of £200 for every twelve hours in such excess on its homeward voyages.

In the service to and from the Cape of Good Hope, the two contracting companies, when their voyages go beyond three days in excess of the time allowed by their contracts (heavy penalties being incurred for one or more of these three days), are liable to a penalty of £6 5s. an hour for each complete hour in addition consumed on the voyage out or home.

1840.—THE PACIFIC STEAM NAVIGATION COMPANY.—The Pacific Steam Navigation Company sends out its ships from London eastward to Melbourne, westward to Valparaiso, and does a large coasting business on the west coast of South America. Its ships run to Australia under the name of the Orient Line, and are splendid specimens of steamers. To this line belong the "Orient," 5386 tons, and the lately-finished steamer "Austral,"[3] whose tonnage is 5588 tons gross. The Orient steamers go to Australia both *via* the Cape of Good Hope and *via* the canal.

The first steamer on the Pacific coast was a small craft named the "Telica," commanded and owned by a Spaniard named Mitrovitch, but his career, as well as that of his vessel, was a short and melancholy one. In a fit of despair at his want of success he fired his pistol into a barrel of gunpowder, blowing up his vessel in the harbor of Guayaquil, and destroying himself and all on board except one man. This lamentable occurrence retarded the introduction of steam on the Pacific coast. But Mr. William Wheelwright, a native of Newburyport, Massachusetts, then United States consul at Guayaquil, saw the great advantages of steam communication along the coast and between the several South American republics, and spent six of the best years of his life in arranging for such communication. Failing to obtain the needed aid and encouragement for his plans in the United States, he proceeded to England, and on the 17th of February, 1840, just about the time that transatlantic steam navigation was an assured success, he obtained,

[3] A telegram from Sydney states that the belief which was first entertained that the foundering of the Orient steamer "Austral," November, 1882, entailed no loss of life proves to have been mistaken. The purser and four of the crew were drowned. Further telegrams received at Lloyd's state that the "Austral," while coaling, keeled over and sank at her moorings. She had 1500 tons of coal on board and a cargo of only 200 tons of iron.—*The Penny Illustrated Paper*, November 18, 1882.

"under letters patent," a charter for the establishment of the Pacific Steam Navigation Company, with a small subsidy for the conveyance of the British mails.

The capital of the company was at first limited to two hundred and fifty thousand pounds, in five thousand shares of fifty pounds each. The whole capital was subscribed for, but only an amount was called up sufficient at the time to enable the directors to provide two boats,—the "Chili" and "Peru,"—which were dispatched to commence operations towards the close of 1840. These vessels were wooden paddle-wheel steamers, sister ships of about seven hundred tons gross register, though with a capacity of not half that tonnage, with engines of about one hundred and fifty horse-power, their extreme length being one hundred and ninety-eight feet and extreme breadth fifty feet.[4] They were at that time considered fine vessels, and on their arrival at Valparaiso they were received with great rejoicings and with salvos of artillery, everybody wishing to visit them, "the President of the Republic, accompanied by his ministers, being among the first to welcome the steamships to the shores of the Pacific."

The company in its early days had many difficulties to overcome, the scarcity of fuel being one of the greatest, and during the first five years sustained a loss of no less than seventy-two thousand pounds upon a paid-up capital of ninety-four thousand pounds. In face of this heavy loss the share-holders resolved to persevere, and in December, 1847, the directors were enabled to give to the share-holders for the first time a dividend, though only two and one-half per cent., on their paid-up capital.

In 1850 four new steamers, viz., the "Lima," "Santiago," "Quito," and "Bogota," of one thousand tons and two hundred horse-power each, in pursuance with a contract with the Admiralty, and costing one hundred and forty thousand pounds, were added to the line, to be employed in a bimonthly service between Valparaiso and Panama.

From 1860 the trade of the Pacific rapidly developed. Steam here, as elsewhere, opened up new and hitherto unthought-of branches of commerce, and from that date the progress of the company has been of unexampled success.

In 1865 the chartered powers of the company were extended to the establishment of lines "between the west coast of South America and the river Plata, including the Falkland Islands and such other ports or places in North and South America and other foreign ports as the said company shall deem expedient."

The directors by degrees applied the compound engine after 1856 to all their steamships, and it is worthy of record that they were not

[4] Lindsay's "Merchant Shipping," vol. iv., has an illustration of the pioneer steamer "Peru."

only among the first, if not the first, to adopt the compound engine for ocean-going steamers, but were almost singular in this respect for upward of fourteen years.

During these years the profits of the undertaking had been steadily increasing, and at a special meeting of the share-holders, held December, 1867, it was determined to add to the operations of the company a monthly line from Liverpool to the west coast of South America *via* the Straits of Magellan.

This entirely new and important though hazardous branch of the service necessitated an increase of the capital of the company to two million pounds. In furtherance of their views the "Pacific," of two thousand tons register and four hundred and fifty horse-power, was sent from Valparaiso in May, 1868, as the pioneer of the new mail line.

The project was successful, and in 1869 the profits of the four new steamers, which had made nine voyages from Liverpool to Valparaiso, were so satisfactory that in 1870 it was determined to extend the voyage from Valparaiso to Callao. Seventeen voyages made in the course of that year with still greater success induced the directors to recommend that the departures thenceforward should be three a month; and in December, 1871, the capital was authorized to be increased to three million pounds, so that the company might be enabled to dispatch every week one of their steamers on this distant voyage.

In July, 1872, the capital was increased to four million pounds.

In 1877, when in command of the United States squadron in the South Pacific, I wrote a letter to the Navy Department, in which I gave the following information in regard to the then condition of this line:

"I forward herewith an advertisement exhibiting the names and tonnage of the *forty-eight* vessels[5] which now compose the steam fleet of the English 'Pacific Steam Navigation Company' on this coast. A few of these vessels have paddle-wheels, but nearly all are iron screw-steamers of power, speed, and good model. Relieved of their light passenger decks and armed, they would in the event of war prove an efficient and formidable auxiliary to the British naval force in these seas as cruisers and 'commerce destroyers.' The schedule and average speed of the coasting steamers of this company, ten knots, is considered their *economical* rate of steaming.

"The *eighteen* steamers of the 'Straits' Line are barque-rigged, have an average tonnage greater than the five 'first-rates' of our navy, are superior to them in speed, are capable of being as heavily armed. In addition to a profitable freight, they carry coal for *forty* days, steaming at the rate of eleven knots per hour under all conditions of wind and

[5] Mr. Lindsay, in his "Merchant Shipping," says the company owned in 1876 four steamships, aggregating 119,870 tons and 20,395 horse-power.

weather, the latter a good desideratum for a country like the United States, having no colonies, and its ships dependent upon home ports for a supply of coal, which are now classed as 'contraband of war.'

"The following memorandum of the performance of the 'Aconcagua,' one of the steamships of the Straits Line, I took from her abstract log by permission of her commander:

"'The Pacific Steam Navigation Company's steamship "Aconcagua," 4106 tons, left Liverpool June 13, 1877, at 8 P.M., and arrived at Callao, Peru, August 9, 1877, at 7 A.M., stopping in the voyage at Pauillac, Lisbon, St. Vincent, Rio Janeiro, Montevideo, Sandy Point, Valparaiso, Arica, and Mollendo, the time occupied on the voyage being 56 days, 5 hours, 50 minutes; the actual *steaming* time, 40 days, 11 hours, 35 minutes. The distance run was 11,033 nautical miles. Coal consumed, 1900 tons. She also expended 656 gallons of oil, 132 pounds of tallow, and 74 pounds of waste. She received on board at Liverpool 1746 tons of coal, and at St. Vincent, 760 tons.'

"The following was her expenditure of coal between the several ports stopped at:

	Tons.		Tons.
Liverpool to Pauillac	139	Sandy Point to Valparaiso . . .	295
Pauillac to Lisbon	148	Valparaiso to Arica	147
Lisbon to St. Vincent	256	Arica to Mollendo	22
St. Vincent to Rio Janeiro . . .	461	Mollendo to Callao	66
Rio Janeiro to Montevideo . . .	155		
Montevideo to Sandy Point . . .	211	Total	1900

"The average of her voyage,—speed, 11.36 knots; revolutions, 50.75 per minute; pressure, 63; coal, 46.91 tons per day. The least average speed made in any twenty-four hours during the voyage was 9.6 knots.

"On her previous voyage the 'Aconcagua' touched at one less port, ran 11,003 nautical miles, and consumed 1776 tons of coal. The 'Aconcagua' has but one smoke-stack, others of the line have two. The Straits steamers have steam-cutters, and all the ships of the company are furnished with steam-capstans."

Two of the ships of this company, viz., the "Iberia" and "Liguria," built in 1873, are each 4671 tons gross register, with a capacity of 4000 tons of cargo, space for 916 tons of coal additional, and accommodation for 800 third-class passengers. On their trial trips these steamers attained a speed of 15 knots per hour. Their length is 425 feet between perpendiculars, and 449 feet over all. Their breadth is 44½ feet; depth of hold, 35½ feet. The engines, which are compound, have each three cylinders, one of 4 feet 8 inches diameter, and two of 6 feet 6 inches diameter, with 5 feet length of stroke.

When we consider that the tonnage of the navy of the United States in 1881, distributed in 22 sailing-vessels, 83 screw-steamers, 26 iron-clads, and 7 side-wheel steamers, in all 138 vessels of every class and

type, amounts to only 143,338, tons, it may be profitable to compare it with the 120,000 tons of this private company, invested in steam-vessels combining the latest improvements in machinery for economy and speed.

The services of the steamers of this company on the west coast of South America have of late been subjected to the depressing influences of the war between Chili and Peru, but the steam trade of the Pacific has steadily and marvelously increased since first opened out by the energy of our countryman, Wheelwright. The people of Chili, sensible of their indebtedness, have erected a bronze statue to his honor in one of the principal plazas of Valparaiso.

The commanders, officers, and engineers of this company are all Britons. The company owns an island in the Bay of Panama, where they have a *gridiron* for hauling up their vessels for cleaning or repair. They have also erected shops at Callao, Peru, fitted with the requisite apparatus, implements, and tools, and maintain there a staff of well-trained workmen. Connected with the establishments at Callao, Panama, and Valparaiso, the company contributes liberally to the support of schools, and for the maintenance of clergymen of the Established Church; and it is also interested in the iron floating-docks at Valparaiso and Callao.

The splendid, we may say, stupendous results of this company are the outgrowth of the project of William Wheelwright, a native of Newburyport, Mass., who, after presenting his plans to the capitalists of New York, and their being rejected by them, presented them in Liverpool, where they met with better success. Thus through the far-seeing of our English brethren the sceptre of the commerce of the Pacific has passed into their hands, and it will require on our part, notwithstanding the predilection our South American cousins have for us, a long pull, a strong pull, and a pull all together before we can regain it or any portion of it.

The "Austral," built on the Clyde by Elder & Co., is 474 feet long over all, has a breadth of beam of 48 feet 3 inches, and her molded depth is 37 feet. Her displacement on the load-line is about 9500 tons. She is ten feet longer, two feet broader, and two inches deeper than the "Orient," but as her lines are finer, her tonnage will not much exceed that of the "Orient." She is built throughout of mild steel, and has 3 steel decks. Between the inner skin and the double bottom she is divided into 19 water-tight compartments. The hull proper is divided by 13 water-tight bulkheads, 10 of which are carried up to the main deck. Above the main deck the ship is divided into 7 fire-proof compartments, and there are ample arrangements for flooding any of the compartments or for extracting water from them, the pumps having a capacity for throwing 2928 tons of water per hour. She has four masts, two of which are square rigged. The cabins are

all placed within the area of the ship, with a gangway four feet wide, running along the vessel *outside* the state-rooms and at frequent intervals across the ship. This permits each state-room to have *windows* instead of air-ports, and the air-port in the side of the ship may be kept open even in rough weather without any fear of the water entering the cabin. This arrangement of the cabins and state-rooms coincides exactly with one proposed by R. B. Forbes, Esq., of Boston, in a pamphlet published by him in 1866. It seems an arrangement that must be universally adopted, as it not only allows the passenger to obtain an abundant supply of fresh air, but prevents his inhaling the foul air which comes up from the hold through the skin of the ship into his state-room when the state-room is built against the sides.

The "Austral" belongs to what is known as the Orient Line of this company, and, as well as the "Orient," is specially designed for the importation of frozen meats from Australia. She is fitted with refrigerating machinery of the capacity of about seven hundred tons, the largest refrigerator room fitted on any ship. At the trials at sea of the machinery it produced a continuous stream of cold, dry air for the meat-chamber, the temperature of the air flowing from the machine being 85° Fahrenheit below zero, and the large chamber kept steadily at zero, or 32° below the freezing point. As the weight of an Australian sheep is about eighty pounds, this enormous freezing machine will keep *twenty thousand sheep* frozen in a perfectly fresh state for any length of time necessary before shipment. The public rooms, engine-room, pantries, and passageways are lighted by the electric light fitted up by Messrs. Siemens with nine arc lamps and one hundred and seventy Swan lamps.

1841.—The Royal West India Mail Steam-Packet Company.—Soon after the Atlantic Ocean began to be regularly navigated by steam-vessels, the importance of a rapid and more frequent means of intercommunication with the West Indies led to the formation of this company, which contracted with the Board of Admiralty in March, 1841, for the conveyance of the mails between England, the West Indies, and the Gulf of Mexico. It commenced operations on a much more comprehensive and grander scale than either the Cunard Company or Peninsular and Oriental. Fourteen large steamships were at once ordered to be built for the service; they were to be of such strength as would enable them to carry guns of the largest calibre then in use on board Her Majesty's war-steamers, with engines of not less than four hundred cohesive horse-power. The contract required one of these vessels to be ready to take the mails on board twice in each calendar month, and to proceed *via* Corunna and Madeira to the island of Barbadoes, and after staying not more than six hours, thence *via* St. Vincent to the island of Grenada, where the stoppage was limited to twelve hours; thence in succession to Santa Cruz and St. Thomas, Tri-

cola Mole, in Hayti, Santiago de Cuba, and Port Royal, in Jamaica. After a stay of not exceeding twenty-four hours at Port Royal, the steamer was to proceed to Savana la Mar, and thence to Havana; returning, she was to call at Savana la Mar, Port Royal, Santiago de Cuba, Tricola Mole, and Samana, in Hayti, delivering mails at each place, "care being taken that the said steam-vessel shall always arrive at Samana aforesaid (after performing the said voyage from Barbadoes under ordinary circumstances of wind and weather) on the twenty-second day after the arrival from England of the mails at Barbadoes;" and after delivering and receiving the mails at Samana, "the steam-vessel shall make the best of her way back from Samana to such port in the British Channel as the said Commissioners of the Admiralty shall from time to time direct." In consideration of this service the company was to receive at the rate of two hundred and forty thousand pounds per annum in quarterly payments. Notwithstanding this large subsidy, the close of the first year's operations showed a loss of seventy-nine thousand seven hundred and ninety pounds, sixteen shillings, eight pence to the company.

By the original arrangements the annual mileage traversed would have been six hundred and eighty-four thousand eight hundred and sixteen miles. Government, however, in answer to the company's appeal, reduced the distance to be performed to three hundred and ninety-two thousand nine hundred and seventy-six miles, without reducing the subsidy. Though these liberal concessions had been made, they were more than counterbalanced by the loss of two valuable ships during the second year. Yet the trade increased so rapidly as to leave in 1843 a surplus of receipts over expenditures of ninety-four thousand two hundred and ten pounds, and in 1844 of one hundred and forty-seven thousand seven hundred and forty-nine pounds. From this time the prospects of the company have steadily improved. In 1850 the mail contract was renewed for ten years from 1st January, 1852, the annual subsidy being increased to two hundred and seventy thousand pounds, the company agreeing to a monthly service to Brazil, and an increase of the mileage to five hundred and forty-seven thousand two hundred and ninety-six miles. The company was also required to increase the speed of the West Indian line from eight knots to ten knots per hour, and to add to their fleet five new steamers of two thousand two hundred and fifty tons and eight hundred horse-power each. In 1864 a third contract was entered into whereby the annual subsidy was reduced to one hundred and seventy-two thousand nine hundred and fourteen pounds, and the speed increased to ten and a half knots per hour in the West India transatlantic service. In 1866 it was agreed each alternate fortnightly packet should proceed from St. Thomas direct to Colon (Aspinwall), instead of first touching at Jamaica, thus shortening the route between England and Panama.

In 1874 the annual subsidy for the conveyance of the West India mails was reduced to eighty-four thousand seven hundred and fifty pounds, not much more than one-third of what the company originally received.

In 1875 a contract was entered into with Her Majesty's government to carry on the Brazilian and River Plata mail service for a payment according to the weight of letters, etc., conveyed.

The early ships of this line were the finest class of paddle-wheel steamers built of wood then afloat, or that had been sent to sea either for naval or mercantile purposes. Thus, the "Forth," one of the original fleet, was somewhere about nineteen hundred tons gross or builder's measurement, eleven hundred and forty-seven tons register, and four hundred and fifty nominal horse-power. She was built at Leith in 1841. As government reserved the right of purchasing any of these ships at valuation, she was, like the others, constructed in accordance with a specification from the Admiralty, under the survey and immediate control of officers appointed for the purpose. Ill luck, however, attended the early days of the company, for though the course of the vessels was a comparatively safe one, they lost six of their ships in the first eight years. The "Isis" sunk off Bermuda, October 8, 1842, having previously struck on a reef. The "Galway" was lost April 15, 1843, twenty miles west of Corunna, when her captain, surgeon, various passengers, and a portion of her crew, consisting in all of sixty persons, perished. The "Medina" was wrecked on a coral reef near Turk's Island, May 12, 1844. The "Tweed," of 1800 tons and 450 horse-power, was lost February 12, 1847, on the Alicranes, a reef off the coast of Yucatan, by which accident seventy-two of the one hundred and fifty-one persons which composed her crew and passengers were drowned. February 1, 1849, the "Forth" was lost on the same rocks which had caused the destruction of the "Tweed," while the following year the "Actæon" was wrecked while rounding the point near Carthagena. Some of these disasters no doubt arose from the intricate character of the navigation among the West India Islands, and others, as it was alleged, "by those sudden changes of weather—hurricanes, squalls, 'norther,' etc.—with which the West India Islands, Spanish Main, and Gulf of Mexico are so frequently visited." But as the company has met with much fewer disasters of late years, incompetency probably had something to do with these almost periodical losses. In November, 1852, the "Demerara," which had been launched the preceding September from the banks of the Severn, was stranded across the river, and so injured that she had to be broken up, and her engines utilized on the "Atrato," an iron paddle-wheel steamer. The "Demerara" was, at the time of her launch,[6] the largest steamship save

[6] The launch of the "Demerara" took place at Bristol. The morning being a fine one, large numbers of persons assembled to witness the floating out; and the vessels

the "Great Britain" afloat. She was 316 feet long over all, 282 feet between the perpendiculars, and 276 feet keel, and was 2318 tons by the old, and upward of 3000 tons by the new, measurement.

The "Atrato" was launched by Messrs Caird & Co., from their yard at Cartsdyke, in May, 1853. Early in 1852 the "Demerara," built on the Severn, was stranded across the river soon after her launch, as stated above, and so much injured that she had to be broken up. For this ship Messrs. Caird & Co. had the engines ready, and the directors immediately gave orders to construct an iron vessel to be fitted with them. That ship was the "Atrato." To suit the machinery it was requisite to maintain the same width as the "Demerara" had been, but the length was considerably increased. The "Great Britain" was of about thirty tons greater capacity, but the "Atrato" was longer by forty feet. Her dimensions were:

	Feet.
Length over all	350
Length of keel and forerake	315
Extreme breadth, including wings	72
Breadth of beam	42
Depth of hold	34

The dimensions of the great war-steamer "Duke of Wellington," three-decker, the largest ship then belonging to the Royal Navy, may be stated by way of comparison:

	Feet.
Extreme length	178
Length of keel and forerake	240
Breadth	59
Depth	24½

The "Duke" was thus less than the "Atrato" by about seventy feet in length and ten feet in depth; the width of the latter being,

in the floating harbor were dressed gayly. Owing, however, to delays, and the water having fallen some eighteen inches or two feet, the spectators were doomed to disappointment, as she could not be got out until the evening's tide, when she floated gracefully upon the water, having been christened by the wife of Lieutenant Hast, R.N., Commodore of the West India Squadron, and future commander of the "Demerara." With the exception of the "Great Britain," the "Demerara" was the largest steamship afloat. Her length of keel was 276 feet; length between the perpendiculars, 282 feet; length over all, 316 feet; or 6 feet shorter than the "Great Britain." Her breadth of beam was 41 feet, and the extreme width, from the outside of the paddle-boxes, 75½ feet; depth to the main-deck, 26 feet 8 inches; depth of spar-deck, 7 feet. Tonnage—by old measurement, 2318 tons; by new measurement, upward of 3000 tons. She was built of sound British oak, teak, and pine, was diagonally trussed with iron, had copper fastenings throughout to the 21 feet mark, and iron fastenings above that. She was propelled by two engines made by Messrs. Caird & Co., of Greenock, which were constructed on the side-lever principle, of the combined power of 750 horses, or 24,500,000 pounds, 96-inch cylinders, and 9 feet stroke, and they were attached to a pair of Morgan's patent feathering float-paddles.

An elegant *déjeûner* was afterwards given at the White Lion Hotel, at which between forty and fifty gentlemen sat down.

from the cause we have mentioned, less by seventeen feet. The height of the "Atrato" from the keel to top of bulwark-rail was forty-three feet. Her bow was surmounted by a spirited representation of an Indian deity, the work of Mr. Peter Christie, of Greenock.

The "Atrato" had four decks, seven and eight feet respectively in height. The spar-deck was flush from stem to stern, affording a promenade the length and breadth of a good street,—three hundred and thirty feet by thirty-eight. She had two funnels and three masts. The standing rigging was light and graceful, being formed of galvanized iron. The masts were fitted with Sir Snow Harris's lightning conductors. The main- and foremasts were "great sticks" of Quebec pine, the former measuring ninety feet long by seven in circumference.

The keel of the ship was formed of nine enormous pieces of iron, and the stem- and stern-posts were each one piece, and both carried besides some distance along horizontally. In the framing and fitting of the paddle-boxes, the beams and stringers, all of patent iron, presented an extraordinary contrast to the great logs used for the purpose in the other ships. The paddle-spaces were forty feet by twelve and a half wide, the wheels of thirty-seven feet diameter, patent feathering principle. The ship was divided into seven water-tight compartments by iron bulkeads. Thirteen hundred tons of iron were used in the construction of the hull. She was propelled by two beam-engines of the collective power of eight hundred horses, and she had accommodations for two hundred and twenty-four first-class passengers.

But by far the greatest disaster which befell any of this company's ships was the destruction of the "Amazon" by fire; nothing could be more terrible than the loss of this ship and the sufferings of those who perished with her. The "Amazon" was launched at Blackwell on the 28th of June, 1851. She was the largest wooden merchant steamship which up to that time had been constructed. She was 310 feet in length, 42 feet in width, 72 feet over the paddle-boxes, and 32 feet in depth; she was about 3000 tons burden, or 2256 tons register, and was fitted with engines of 800 horse-power, the diameter of the cylinders being 96 inches each, and the stroke 9 feet. The engines made 14 revolutions of her wheels, which were 41 feet in diameter, per minute, giving her a speed by log of 11 knots. Her cost was upward of £80,000, and when ready for sea somewhat over £100,000. When surveyed by the Admiralty before her departure from Southampton she was reported capable of carrying fourteen 32-pounders and two 10-inch pivot guns of eighty-five hundred-weight each, and her coal-bunkers were constructed to carry 1000 tons of coal, sufficient for sixteen and one-half days' full steaming. On the 2d of January, 1852, the "Amazon" sailed from Southampton on her first outward voyage. On the 4th of January, when about 110 miles W.S.W. of the Scilly Islands, the watch on deck discovered that a fire had broken out sud-

denly on the starboard side forward, between the steam-chest and the galley, the flames at once rushing up the gangway in front of the foremost funnel. All efforts to check the progress of the fire proved futile, and the most terrible consternation and confusion prevailed, the gale which howled overhead and around them increasing the terror of the awful calamity. The boats were burnt where stowed or swamped when lowered, save two of the life-boats and a small dingy, in which sixty-five of the one hundred and sixty-one souls on board managed to escape from the burning wreck; ninety-six, including the captain, perished in the ship.

These losses left the company only the "Orinoco," "Magdalene," and "Parana" for the direct service between Southampton and Colon; but, stimulated rather than depressed by misfortune, they chartered other vessels, and entered into the construction of steamers of a still finer description. When the government relieved them from the condition of building wooden vessels adapted for purposes of war, and the directors discovered that iron was preferable to wood, and the screw a better mode of propulsion than the paddle, they produced vessels equal to most of those engaged in transatlantic navigation.

There are not now many finer vessels afloat than the "Tagus" and "Moselle," launched in 1871, and the later ships of this line. The "Moselle," of about 3200 tons gross register, and engines of 600 horse-power, made 14.929 knots per hour as the average per four runs over the measured mile; and the "Tasmanian," an iron screw-vessel, also fitted in 1871 with compound engines, accomplished her first voyage to St. Thomas in fourteen days and two hours, on a consumption of only 466 tons of coal, though before the alteration in her engines she had consumed 1088 tons in making the same voyage.

The fleet is now a fine one, consisting of twenty-four steamships of from 3472 tons registered tonnage down to 1000, and nearly all iron screw-vessels.

1847.—THE COLLINS LINE.—In 1847 Mr. Edward K. Collins,[7]

[7] Edward K. Collins, founder of the first American line of steamships between New York and Liverpool, was buried June 26, 1878, from his former residence, at Madison Avenue. The remains were taken to Woodlawn Cemetery. Representatives from all the large steamship lines in the vicinity attended. He was born at Truro, Massachusetts, in 1802. He entered upon mercantile pursuits in early life, and on settling in New York City soon acquired a reputation for great activity and enterprise in commercial affairs. He organized a line of sailing-packets between that city and New Orleans, and Vera Cruz, Mexico, which were so successful as to induce him to turn his attention to the passenger traffic between New York and Liverpool. He accordingly established the Dramatic Line of sailing-packets, comprising the fine ships "Shakespeare," "Garrick," "Siddons," and "Roscius." He had them constructed with full poops, with a view of affording increased accommodations for cabin passengers, which was considered quite an improvement over the "old liners" then in use, and as a consequence he soon distanced his competitors in gaining the patronage and favor of the public. The Dramatic Line became famous and was a successful pecuniary enterprise. The great success attending his efforts

with others, emulous of the success which had attended the Cunard Line, contracted with the government of the United States to convey the United States mails between New York and Liverpool, agreeing to make twenty voyages in each year, and to employ five first-class vessels in doing so. For the fulfillment of this agreement the Collins Company was to receive $19,250 per voyage. The company was unable to get the vessels ready within the stipulated time, and the time for their completion was extended. It was also favored with an advance of $25,000 a month on each vessel from the date of its launch until the sum should amount to $385,000. It was also agreed on the part of the government that the company should not be compelled to complete its fifth vessel. Then, in consideration of the company's making twenty-six instead of twenty annual voyages, the subsidy was increased from $19,250 to $33,000 per voyage, or to $878,000 yearly. For these pecuniary considerations the company was urged by the United States government, and endeavored, as well as agreed, to make the fastest passages between England and America. This endeavor was made with great spirit, and statements submitted to Congress show that it cost nearly half a million of dollars annually to effect the saving of a single day or a day and a half on the passage to Liverpool. Notwithstanding its large subsidy, the Collins enterprise, after sustaining the loss of two out of four of the company's ships, completely failed.

The history of the Collins fleet, the ships of which were in their day the finest afloat, both as to accommodations and speed, is soon told. The "Arctic" was run into by the French steamship "Vesta" in mid-ocean, September 27, 1854, and sunk; the "Pacific," with 240 souls on board, including the wife of Mr. Collins, was never heard from after sailing from Liverpool. The "Atlantic" was the pioneer steamship of the line. She sailed from New York April 27, 1849, and arrived in the Mersey May 10, thus making the passage in about thirteen days, two of which were lost in repairing the machinery; the speed was reduced in order to prevent the floats from being torn from the paddle-wheels. The average time of the forty-two westward trips in the early days of the line was 11 days, 10 hours, and 26 minutes, against the average of the then so-called fastest line of steamers, 12 days, 19 hours, and 26 minutes. The "Atlantic" was broken up in New York in 1879. On her arrival at Liverpool, in 1850, she was found to be too large for any of the docks, so of necessity lay out in the river.

The "Adriatic," the queen of the fleet, the only screw-ship of the

in this direction finally led him to entertain the idea of establishing a steam line of packets. In nautical circles the project at once excited considerable interest, and also secured the sympathies of the people. A subsidy from Congress was granted for carrying the mails.

line, was purchased by an English company, and is now used as a coal-hulk. To such base uses do we come at last.

This leaves only the "Baltic," a vessel which cost $700,000, to be accounted for. It is claimed that she made the quickest trip under steam alone that had ever been made in crossing the Atlantic. The White Star steamships, which later have made such rapid passages, spread nearly an acre of canvas, while the "Baltic" had comparatively no canvas.

After the failure of the Collins Line, the "Baltic" was in government service during the Civil War, and afterwards, altered into a sailing-ship, made several trips from San Francisco to Europe with wheat, her freight sometimes amounting to more than $70,000. She was sold to a German company, who hoped to sell her to Russia during the Turkish war, but the war ceasing, she was sold to private owners, and on her passage from Bremen to Boston met with a terrific gale, which strained her so badly that it was determined to break her up for the material in her. Soon, said a Boston paper of October, 1880, all that will be left of the "Baltic" will be a collection of old junk and a smoking hulk at Apple Island, the graveyard of many a fine vessel. So ended the last of the Collins Line, all of which were paddle-wheel steamships, excepting the "Adriatic," which never made a trip on the line.

The "Adriatic" was launched April 8, 1856. Her length was 345 feet; beam, 50 feet; depth of hold, 33½ feet; registered tonnage, 4144.75. The "Adriatic" was purchased by the Galway Company in 1861. The transfer of this ship to the English flag does not seem to have reduced her speed or detracted from her sea-going qualities, for she made the run from Galway to St. Johns in six days, the specified time, and having completed this passage to New York in one day fifteen hours, and three-quarters less than the contract time, returned from St. Johns to Galway in *five days, nineteen* hours and three-quarters, perhaps the quickest passage on record from port to port across the Atlantic.[7]

The principal dimensions of the "Atlantic" and of the "Pacific," a sister vessel, were: Length between the perpendiculars, 276 feet; beam, 45 feet; across the paddles, 75 feet; depth of hold, 31 feet 7 inches; diameter of wheel, 36 feet; tons burden, 2860, and she was said to be the largest steamship that had been built.

The "Arctic," the fastest steamer of the line, was modeled by George Steers, who designed the yacht "America;" her tonnage was 2856 tons; length of deck, 282 feet; breadth, 45 feet; and depth below main deck, 24 feet. Her cylinders were 95 inches diameter,

[7] Appendix No. 6 to the Report of the Committee of the House of Commons. For a history of the Galway Line, which was unsuccessful, see Lindsay's "Merchant Shipping," vol. iii.

stroke 10 feet. On her eighth passage from New York to Liverpool she made the then extraordinary time of 9 days, 17 hours, and 12 minutes. Her paddle-wheels were 35 feet 6 inches diameter, and contained each thirty-six floats. She burned about 87 tons of coal a day.[8]

From the start the Collins Company suffered from want of capital. Although the four vessels of this company cost $2,944,142 its paid-in capital only amounted to $1,200,000. It began, therefore, with a debt of $1,744,122, which was a continual drain for interest and commissions. With careful management this difficulty might have been overcome, for its receipts from the government for the transportation of mails during the first five years amounted to more than the cost of the vessels. Its receipts from other sources were large, and when the "Arctic" and "Pacific" were lost they were insured for their value at the time. Mr. Collins submitted to Congress the following statement, dated February 17, 1855:

Total receipts for passengers and freight	$4,460,867
" " mail service	3,413,966
	$7,874,833
Total disbursement	7,207,291
Leaving a nominal surplus of	$667,542

which was more than disposed of, as follows:

Loss of the Arctic	$255,000
Depreciation of investment	258,000
7 per cent. interest on capital	408,000
	$921,000

[8] Sir Edmund Cunard testified, in 1860, that the Collins Line got at first for twenty-four voyages $401,040 from the United States government, and that afterwards it received $893,750 for twenty-six voyages, or double his own subsidy, considering that he made two voyages to one. The capital of the Collins Line, $3,500,000, he said, would have been entirely sunk but for the loss of two ships, by which they got $1,250,000 from the English underwriters.

He said if his contract was withdrawn he had better sink his ships than try to keep them, for they were not adapted for mercantile uses. The "Scotia" cost him $900,000. Cunard's original subsidy, for twenty-four voyages a year, was $300,000 per annum for seven years. In 1852 he agreed to make a weekly service for $865,000 a year, to last ten years; five years afterwards he demanded a larger extension of the contract, so he could borrow money to build faster steamers than Collins. Collins's original four steamers cost $2,994,000, and his last experiment, the "Adriatic," ruined him. The average cost of each of his early voyages was $65,215, and the corresponding receipts $48,287, yet he carried more passengers from the beginning to the end than the Cunarders.

Mr. Collins's first proposition to the government of the United States was in 1845, but no contract was concluded with him until 1847. The "Adriatic" was the first to take her departure for Europe, in April, 1850, the "Pacific" followed in a few weeks, then the "Adriatic," and the "Baltic" soon after. These vessels were alike in model and in dimensions.

The all-controlling desire which seemed to outweigh every consideration of prudence was principally in relation to speed. Mr. Olds, of Ohio, in the United States House of Represenatives, expressed the feeling of multitudes in the country when he said, "We have the fastest horses, the prettiest women, and the best shooting-guns in the world, and we must also have the fastest steamers. The Collins Line must beat the British steamers. Our people expected this of Mr. Collins, and he has not disappointed them."

The Collins Line were as substantially and economically built vessels as any of their time. After running six years their cost for repairs was more than the previous cost of the ships, or eighteen per cent. per annum.[9]

[9] Raney's *Ocean Post.*

GEORGE H. PREBLE,
Rear-Admiral U.S.N.

(To be continued.)

AMONG OUR CONTEMPORARIES.

A WRITER in the *Nautical Magazine*, who signs himself "Meteor," has a capital article upon "The Supply of Seamen," in the course of which he says, "A short summary of Admiral Hornby's plan for manning the mercantile marine and the Royal Navy, as expressed in his letters to the *Times* and elsewhere, will not be out of place. In 1891 he suggested that not less than forty-five hundred boys should be entered and trained every year for the Royal Navy. Each of these sea-loving youngsters would have to serve eighteen months in a harbor training-ship, three years in a sea-going sailing cruiser, and three years in a steamship of the Royal Navy. After having passed this probationary period of seven years and a half, and arrived at man's estate, permission would be granted to join the merchant service with reserve pay, and in this way constitute an efficient royal naval reserve." Admiral Hornby, in his letter, which appeared in the *Times*, pointed out that the number of British-born able-bodied seamen is officially stated to be fifty-three thousand, and in 1892 they had to be supplemented by thirty thousand eight hundred and ninety-nine foreigners. "Moreover," he wrote, "ship-owners complain that they are obliged to employ many of those foreigners as mates, and even as captains, for want of competent Englishmen."

Later on, "Meteor" says, "The United States government is deserving of praise for an honest endeavor to keep up a steady supply of skilled citizen seamen," referring to the "Enterprise," of Boston, the "St. Mary's," of New York, and the "Saratoga," of Philadelphia. And remarks, "London and Liverpool might easily support such a vessel from each port."

General Schofield's annual report—which may be looked upon as his military testament, since he is to be retired by operation of law during the next year—has excited much more attention from the people at large than such documents usually do. One of the most striking passages in the report is that in which he states that the feeling of confidence and invincibility, left by the favorable outcome of our own Civil War, is not justified by the facts. He frankly states that that was a contest of superior numbers and resources against an adversary inferior in

both, and very little better prepared for the contest, yet the result was only reached after a long, desperate, and exhausting struggle, characterized for the most part during the first half of its term by military failures or imperfect successes, due entirely to lack of previous preparation.

We suppose that there is no one who gives the matter any serious thought who dissents from this opinion of General Schofield. But hear him further, "Continual isolation is no longer any security against formidable attack. Great population and wealth are only the crude materials from which military strength may be created. No nation, however populous and wealthy, can hope to maintain itself among the great nations of the earth, unless its military strength is made by development to bear a reasonable proportion to that maintained by the other great nations. The conflicting interests and jealousies of other nations may at times prevent any of them from engaging in active hostilities against this country; but at other times similar interests and jealousies are as likely to unite them against us. Are the United States willing to occupy this humble place of dependence upon the interests and jealousies of other nations? Or will they assume and maintain their great place among the nations of the earth, —mistress of their own policy, and arbiter of their own destiny?"

The events of last summer are dwelt upon to show that our danger from internal enemies alone should warrant an increase in the number of the permanent force. The belief that the country is safe in the hands of a citizen soldiery has been rudely shaken in more than one instance; and the fear of many patriotic persons that militarism would become the ruling power if the peace army were to be materially increased has changed to a conviction that a compact, well-drilled, and well-prepared army may, at some not very distant day, become the savior of order and of our institutions.

As long as our constitution and laws exist militarism cannot exist. As a contemporary has justly remarked, when speaking of this subject, "Much of the opposition to the army, to be consistent, ought to insist on the abolishment of the army entirely. That is out of the question, though; and, that being true, it is wisdom to impartially consider the proposition that the army be made really effective, that it be increased in proportion to the increase of population, and in proportion to the increase of the service expected of it."

A daily contemporary—in a well-considered article, which is too long to quote as a whole, the subject of which is the "Passing of the Old Soldier"—tells us that from 1879 until the end of the last fiscal year there had been an increase in the number of pensioners, but from the latter date a certain and material decrease has occurred. This decrease must inevitably continue unless Congress sees fit again to

meddle with the pension laws, and to add new classes to the lists, "which time and death are inexorably shortening."

One of the most forcible reminders that age is telling upon the men who were at the front during our Civil War is the fact that it was officially announced, at the last meeting of the Grand Army of the Republic, held at Pittsburg, that hereafter the parade of the veterans, always one of the most impressive features of the annual meetings, would cease to be a part of the proceedings,—the reason being that the advanced age and consequent infirmity of so many of the survivors of the war rendered the physical exertion too great a strain on their failing strength.

No nation, ancient or modern, ever provided for their soldiers, who served them in time of need, so liberally as the Republic has done. No matter what the motives which admitted to the pension rolls the names of many who are found there, it is important and interesting to learn that at the close of the last fiscal year the number was 960,544. A few of these are the survivors of the Mexican, Seminole, and other Indian wars; but the number, as compared with those who served in the great Civil War, is insignificant. At the close of the previous fiscal years there were 966,012 names on the list. During 1893–94 there were added to the roll 30,085 new names, and 2308 previously dropped pensioners were restored to it, and 37,051 were removed from it by death or for other causes. The new claimants decreased from 363,799 in 1891 to 40,148 in 1893–94.

It is to be hoped that we have seen the end of pension legislation, which at one time fostered a set of sharks in the shape of agents, whose ill-gotten gains must run into the millions. No officer who served during the Civil War, much more no medical officer who so served, can be ignorant of instances of attempted fraud which should have landed the perpetrators in State prison. Fortunately, the game of these people was blocked by legal enactments; but not before they had succeeded in looting the treasury for an almost incredible sum.

Like the buffalo of our own land the giant tortoise of the Galapagos group seems destined to extinction, or, at best, to be kept as curiosities.

The tortoises, interesting survivors of the tertiary period, which existed in great numbers at the beginning of this century, are now reported by Professor Baur, who has recently returned to Washington from a visit to the islands, very scarce. He found, after a complete exploration of one of the largest, only twenty of these animals. Of these he took eight, sparing the rest. Four of them he sent to Lincoln Park, in Chicago, and the others died. We are not informed by the newspaper from which we derive this information w hat was the cause of death, but

it seems strange that half of the number selected should have died if ordinary care was shown them, for they are most tenacious of life, and with a little fresh water and a modicum of any green food, have lived for months on the decks of men-of-war and whale-ships. In former days they existed in their native isles in myriads, as many as six thousand being, it is said, taken from Charles Island in a single year; and it is reckoned that some millions of the creatures have been taken by ships since the Galapagos were first discovered. On Duncan and Albemarle Islands, the only ones of the group on which the chelonians still exist, the few survivors keep high up in the mountains, in the near neighborhood of the few scanty springs of fresh water.

Farragut mentions in his journal of the cruise of the "Essex" the capture of some armed whalemen near the Galapagos, saying that, in clearing for action, they hove overboard several hundred of the tortoises, many of which the "Essex" picked up after the vessels had been taken possession of. He says that they floated like corks, stretching their long necks upwards in evident fear of being drowned. Can we not fancy the boy midshipman riding about the deck of the "Essex" on one of these huge creatures? How recent volcanic action has been in this group is shown by an entry in the journal of the existence of one of the volcanoes of Narboro Island in a state of active eruption while the "Essex" was there,—"a beautiful sight."

Captain Porter, in his "Cruise of the 'Essex,'" calls the animals of which we have been speaking "Elephant tortoises," and says that many of them reached the weight of three hundred pounds, "and nothing, perhaps, can be more disagreeable or clumsy than they are in their external appearance. Their motion resembles strongly that of the elephant; their steps are slow, regular, and heavy; they carry their body about a foot from the ground, and their legs and feet bear no slight resemblance to the animal to which I have likened them; their neck is from eighteen inches to two feet in length, and very slender; their head is proportioned to it, and strongly resembles that of a serpent; but, hideous and disgusting as is their appearance, no animal can possibly afford a more wholesome, luscious, and delicate food than they do; the finest green turtle is no more to be compared to them in point of excellence than the coarest beef is to the finest veal; and after once tasting the Galapagos tortoises every other animal food fell greatly in our estimation."

The gallant captain has much more to say as to the gastronomic qualities of the tortoises, but we must remember that even cabin stores, in those days, did not afford much variety, and the "Essex" had been a long time at sea.

Upon dress occasions the first Prussian Foot-Guards turn out in much the same uniform which they wore in old "Fritz's" time, with

the peculiar head-gear with which we are familiar in the pictures of the Hessian troops which served in this country during the Revolution. On great occasions they also take the peculiar kick-out step, when passing the reviewing officer, which was practiced when the regiment was first formed. This fine regiment probably never showed to greater advantage than on the occasion of the review held by the three emperors—Russia, Austria, and Germany—soon after the close of the Franco-Prussian war, and which the writer had the good fortune to witness. On this occasion the Foot Guards easily took the palm; although some qualified judges thought that the artillery ran them very closely for drill and appearance. The *Illustrated London News*, in speaking of one of its illustrations representing the assembly of the officers of the First Prussian Foot-Guards, says, "As German emperor, William II. has no life-guards, but as king of Prussia, his Majesty has one of the finest corps of that class belonging to European sovereigns. The First Regiment of Foot-Guards is notable in the military history of that monarchy; among its officers are the most illustrious Princes, each Prussian king having, from his youth, served in his turn; and the biggest and strongest men of North Germany who are qualified by aristocratic birth for such a commission."

The paper then gives a cut presenting the Imperial Crown Prince Fredrick William, a boy twelve years of age, in the centre of the group, with the son of Prince Albert of Prussia (who is somewhat older and bigger) on his left; and on the right hand Captain von Plüskow, seven feet two inches of stature, the tallest officer of the German army.

It would take many pages to give even a list of the books which the recent Napoleon worship has given to the public. Of these, as is natural, the large majority have issued from the French press; and, easily first of all, was the delightful souvenirs of Baron Marbot,—remarkable from every point of view, beside possessing literary merits not often found in writers who have followed the career of arms, in busy times, from youth to mature middle age.

Lately the military publishing house of L. Bandoin, in Paris, has reprinted the memoirs of another Baron,—Seruzier, colonel of light artillery,—who was nick-named by the great emperor "Jupiter Moustache," from the prompt thunder of his guns on many a stricken field; "but the soldiers who did not know Jupiter, gave him the *sobriquet* of *Père aux boulets*. This latter name the emperor sometimes gave him, but often called him *Mon vieux*."

Seruzier entered the army at the age of fourteen (he mentions that he looked much older), in 1783, and served continuously, first under the white flag, and then under the tricolor, until the first downfall of the emperor, taking part in the principal battles from the year V. to

1815. His memoirs were written in prison in 1818, when he was confined under a charge of conspiracy, in what was called the "affair de Quincampoix." Of this charge he was triumphantly acquitted.

It is difficult to see why Seruzier, with his brilliant service, and, as he states, never having the slightest black mark against him, should not have risen to a higher military rank. The inference is that Napoleon, who thoroughly understood him, knew when he had a first-rate artillery officer, and perhaps did not feel so certain as to his merits should he be made a general. He was made a Baron of the empire on the field of Wagram, with a dotation of four thousand francs per annum, and the personal assurance of the emperor "that he was well content with him." On many other occasions he received the warm commendation of his exacting master,—yet he died "*Colonel d'artillerie legère, en retraite.*"

His editor, Le Miere de Corvey, says in regard to this, "The attention of the emperor was first particularly drawn to Captain Seruzier on the day of Austerlitz. After that he always had a distinguished part to play in all the great battles; and we will see, as we go on, that extraordinary forces were confided to his command at critical moments. As a captain he frequently commanded in battle a regiment of horse-artillery; as a colonel he often had control of a hundred pieces or more. The readers of his memoirs will see that the unheard-of successes obtained on many of our great battle-fields were due, in part, to the audacious execution of movements up to that time unusual for artillery, but put in practice by Colonel Seruzier."

His high reputation as an artillery officer is shown by an event which occurred during the meeting at Erfurt, in September, 1808, of Napoleon, the emperor of Russia, the king of Prussia, and all the kings and princes of the Confederation of the Rhine. At this time reviews of some arm were held every day, and Seruzier had been sent for to take command of the horse-artillery, which was to manœuvre before the august personages. One day the Grand Duke Constantine asked the colonel to let him have the command of one of his batteries, adding some very flattering remarks. "I replied," says Seruzier, "that such a position was not proper for him; but as he insisted upon it, I had to send my adjutant-major to inform the major-general of the request." The major-general (Prince Berthier) said to Napoleon, "Sire, the brother of the Czar asks permission to manœuvre one of Seruzier's batteries, and I think he might temporarily cede the whole command to the prince, as it would greatly please him."

"You must be joking," replied Napoleon; "it is enough that the grand duke has one of Seruzier's companies: let old *Père aux boulets* keep his own command-in-chief."

Constantine went through the exercise as Seruzier's subaltern, and was so pleased at the way in which things went, that he invited the

colonel to dinner, and they came to know each other very well, a fortunate thing for Seruzier, as it afterwards turned out; for, during the Russian campaign, the French colonel was dreadfully wounded, and stripped of everything by the Cossacks of the Hetman Platoff, on the route from Wilna to Kowno. His sufferings from cold and loss of blood proved nearly fatal, as he received no proper care. But at last he fell in with a Russian colonel whom Seruzier himself had taken prisoner at Austerlitz and had treated well. The Russian reciprocated his kindness, and gave him some money, but could not stay long with him; his assistance, however enabled him to reach Wilna alive. At this city the Grand Duke Constantine was staying, and he saw that he received every attention necessary in his dismal condition,—recalling the time that he had served under him, and seeing that a letter from Seruzier to Marshal Ney was safely conveyed, and the reply, with an enclosure of funds, returned to him. The grand duke spent much time with him, talking about artillery, and got Seruzier to show him a peculiar knot used by the French in their prolonges, and which he did not know how to make.

Seruzier recovered from his wounds slowly but surely, and, after a considerable time, was exchanged for General Count Orloff.

During the hundred days Seruzier was sent to Toulon as director of artillery of the Army of the Var. After the assassination of Marshal Brune all the generals left, until, as senior colonel, the command-in-chief devolved on Seruzier. During this time the English, who were blockading the place, offered the commandant a large sum if he would deliver the port, the arsenals, and the fortifications into their hands; offering, also, to convey himself and family to any part of the world which he might select as a residence. They added that the Emperor Napoleon, for whom he commanded, no longer reigned in France, but having voluntarily become a prisoner of the English, all allegiance to him was at an end. Seruzier sent off the envoys in short order, with some wholesome truths to digest, and held the place until the government of Louis XVIII. could take possession.

This was his last military service.

Most naval men who served during the Civil War will remember the singular history of the torpedo boat which sunk the steam-sloop "Housatonic," off Charleston, in February, 1864.

Maclay, in his recently published second volume of "The History of the Navy," says, "She was built in Mobile, in 1863, and was designed to dive under water, the motive power being a propeller worked by eight men. While on her trial trip she sank, the crew of ten men suffocating. Being raised, she was taken to Charleston in 1864, where she was sunk by the wash of a passing steamer, her crew, with the

exception of Lieutenant Payne, going down with her. She was raised, but while at the wharf near Fort Sumter, sank for the third time, carrying down all her men excepting Lieutenant Payne and two seamen. Soon afterwards she made several successful dives in Stone River, but at last stuck her nose in the mud at the bottom of the river and the crew suffocated. For the fourth time she was raised, but in attempting to dive under a schooner for practice she fouled the cables, and again the crew perished. After being under water a week she was raised, and Lieutenant George E. Dixon, with Captain I. F. Carlson and five men, volunteered to go in her and blow up the 'Housatonic,' in spite of the fact that the torpedo boat had already been the coffin of over thirty men. The daring men set out a little before nine o'clock, February 17, and came near the Federal ship before discovery and exploded the torpedo. The 'Housatonic' sank quickly, carrying down Ensign Hazelton and four men, while the rest of the crew took refuge in the rigging, which remained above water when the hull touched bottom. The torpedo boat, however, never came to the surface again. After the war, when the wrecks off Charleston were being removed, the boat was discovered on the bottom about a hundred feet from the 'Housatonic;' all her men were at their stations."

A Washington correspondent of the Philadelphia *Times*, in speaking of the coming revision of the manual of arms, says, "The proposed changes in our manual, erasing the few fancy and useless movements still remaining after the revision of three years ago, will establish for America an identity such as Germany now alone enjoys in the military world.

"For nearly a century and a half, up to the present generation, all enlightened nations closely followed one another in the adoption of rules for drill.

"Frederick William I. of Prussia, the father of Frederick the Great, is called the founder of the condensed manual of arms, although he is now accussed of having borrowed his ideas from the Spaniards, who first used the firearm as an army weapon. Frederick William drilled his giant Potsdam Guards—some of whom, it is said, were eight and a half feet in height—according to this first system, which partly established his reputation as a crank. His musket drill was regarded as a standing joke throughout Europe until the time of the famous victories of Frederick the Great, who had revised his father's system—originated for shows and parades—and thereby routed the proudest forces of the Continent. After this the Prussian tactics were translated and distributed into every nation of Europe, being improved principally by France during the Napoleonic wars.

"But America got her first drill-book direct from head-quarters.

Baron Steuben, the drill-master of Washington's army, was an officer in the wars of Frederick the Great, and, like Lafayette, offered his military knowledge to promote the independence of our patriots, who at that time could handle little else than the axe or the pitchfork.

"Since Steuben's book our system of instruction has suffered revision almost always on the event of the introduction of new methods in the foreign armies. The greater part of these new systems were copied from the French, up to the time of Upton, who was the first American tactician in the true sense of the term."

E. SHIPPEN.

NAVAL AND MILITARY NOTES.

NOTES AND DATA ON NAVAL AND MILITARY MATÉRIEL AND ALLIED SUBJECTS.

It is the intention to collect and publish in this department of the "United Service" all information obtainable from current publications and other available sources concerning ships, guns, armor, explosives, small-arms, military and maritime affairs, and kindred subjects. As the data are derived largely from unofficial sources, strict accuracy cannot be expected; but all reports will be carefully examined and compared with others on the same subject, and it is hoped, by this means, to attain fairly correct results. Erratum notices will be published whenever errors are discovered in data previously given. As the development of the present plans for collecting information progresses, it is hoped to secure fuller and more authentic reports.

ABBREVIATIONS USED IN THE NOTES.

b.l. = *breech-loading guns of ordinary (not rapid-fire) type.*
cm. = *centimetre.*
f.a.m.l. = *fore and aft midship line.*
I.H.P. = *indicated horse-power.*
l.w.l. = *load water-line.*
m.g. = *machine gun.*
mm. = *millimetre.*
pr. = *pounder (as 6-pr.).*
r.c. = *revolving cannon.*
r.f. = *rapid-fire.*
r.f.g. = *rapid-fire gun.*

WAR-SHIPS AND TORPEDO-BOATS.

Great Britain.

"ALGERINE," "PHŒNIX": DESCRIPTION.—These gunboats are to be built at Devonport. The dimensions are: length, 185 feet; beam, 32 feet 6 inches; mean load draft, 11 feet 3 inches; displacement at this draft, 1050 tons. The armament consists of six 4-inch R.F.G., some of the new 12-pounder R.F.G., four 3-pounder R.F.G., several Maxim machine guns, and they will be fitted with torpedo-tubes. The coal supply at load draft is 160 tons, but space is provided for an extra amount when absolutely required. The machinery of these vessels has not (at date of writing) yet been ordered. It is to be of sufficient power to develop a speed of 14 knots with moderate forced draft. Both vessels are to be ready for sea before April, 1896. The estimated cost is £70,000 each, and £33,632 is to be spent in the first year after laying down.

"VICTORIOUS": KEEL LAID.—The first keel-plate of the battle-ship *Victorious*, 14,900 tons, was laid at Chatham, May 28, 1894.

"HERMIONE": TRIALS.—The protected cruiser *Hermione* had her natural (assisted) draft and forced draft trials on May 10 and 12, 1894, respectively. The mean results of the so-called natural draft trial were: revolutions, 128.7; steam at boilers, 140; vacuum, 26.3; I.H.P., 7393; speed not reported; air-pressure 0.45 inch. The results of the forced draft trial were: revolutions, 137.4; steam at boilers, 144; vacuum, 26.8; I.H.P., 9264; speed not reported, but said to exceed 19.5 knots. The contract requirements for I.H.P. were 7000 with natural draft and 9000 with forced draft.

"DRYAD": TRIALS.—The torpedo-gunboat *Dryad*, 1077 tons, completed

her trials in April last. The results of the 8-hour natural draft trial, on April 18, were: steam in boilers, 134.6; vacuum, 26.3; revolutions, 213.8; I.H.P., 2696; air-pressure in fire-rooms, 0.96 inch; speed not reported. The results of the 3-hour forced draft trial, on April 26, were: steam in boilers, 149; vacuum, 27.4; revolutions, 242; I.H.P., 3709; air-pressure, 2.28 inches; speed by patent log, 18.5 knots.

"WATERWITCH": SPEED ON TRIAL.—The yacht *Waterwitch*, recently purchased for surveying duties in Australian waters, has had her steam trials and attained a speed of 10 knots.

"SYBILLE": MACHINERY ACCEPTED.—The machinery of the protected cruiser *Sybille*, 3400 tons, has at last been accepted. This vessel has given considerable trouble on account of defective furnaces; but after having had defects made good, she was a short time since subjected to a steam trial, which proved successful. The total cost of her machinery has been £67,158, and this amount has been paid by the Admiralty, although they have received the contractors' guarantee to be responsible for any defects which may develop during the next two years. It was stated that the cost to the contractors of replacing the defective furnaces has exceeded £3000.

"CONQUEST": REFIT.—The partially protected cruiser *Conquest*, 2380 tons, is now undergoing a thorough overhauling and refitting at Devonport for service as a training ship. The estimated cost is £31,000. She will retain her present square rig.

France.

NAVAL BUDGET FOR 1895.—The French naval budget for 1895 calls for an expenditure of 277,516,311 francs. The effective force of the navy will consist of 42,205 men and 1842 officers. For ships building and under construction the ordinary appropriation is 32,150,000 francs, and the extraordinary, 3,500,000. For ships in dock-yards 27,000,000 francs are appropriated. The following vessels will be completed for trials in 1895: battle-ships, *Charles Martel*, *Jaureguiberry*, and *Lazare Carnot;* coast defence armor-clad, *Tréhouart;* armored cruiser, *Bruix;* second-class cruisers, *Bugeaud*, *Chasseloup-Laubat*, *Friant*, and *Descartes;* third-class cruiser, *Linois;* torpedo-gunboats, *Cassini* and *Casabianca;* station gunboat, *Surprise;* 1 sea-going torpedo-boat, 5 first-class boats, 4 second-class boats, and one submarine boat (the *Morse*). There will be 214 torpedo craft kept ready for immediate service in European waters, either in commission, partial commission, or in the immediately available reserve. Of them, 110 will be attached to the Channel fleet and 104 to the Mediterranean. This number (214) is made up as follows: 5 torpedo-cruisers, 8 torpedo-gunboats, 13 sea-going torpedo-boats, 66 first-class torpedo-boats, 81 second-class torpedo-boats, 35 third-class torpedo-boats, 6 vedette boats, and 2 other craft.

The other vessels to be kept in commission, or in readiness for service, are as follows:

Class of Ship.	Mediterranean Fleet.	Channel Fleet.	Special Reserve.
Battle-ships . . .	12	1	
Sea-going coast-defense armor-clads	4	5	
Armored cruisers	3	1	1
Other cruisers .	10	3	1

"COETLOGON": TRIAL.—The *Coetlogon* has at last had a successful trial. The speed developed slightly exceeded 19 knots, and the vibration and thumping of the engines were no longer noticeable.

"SUCHET": FURTHER TRIALS.—On April 23 and 24 the *Suchet* continued her progressive trials. With 2500 I.H.P. the speed was 15 knots, and with 1000 I.H.P., 10.8 knots.

"DUQUESNE": 24-HOUR TRIAL.—The 24-hour trial of the *Duquesne* was very successful. The machinery worked satisfactorily in all respects and a speed of 16 knots was developed.

"LANSQUENET": RETURNED TO BUILDERS.—Owing to defects in construction, the sea-going torpedo-boat *Lansquenet* has been returned to her builders for alterations in her machinery. It is expected that the necessary work will require three months to complete.

"FURIEUX," "REQUIN": CHANGES IN ARMOR. — The despatches concerning the removal of a part of the armor plating from the *Furieux* and the *Requin*, which have agitated the French Extra-Parliamentary Commission, have been published by the *Justice* and the *Marine de France*. It appears that in September, 1892, it was proposed to add certain splinter-proof shelters to the vessels named (as well as to the *Surcouf*); but M. Burdeau, then Minister of Marine, gave instructions to the naval prefect at Cherbourg that such additional weights could not be borne by the two "coast-defense" vessels. They were, he said, already so deep in the water that there was danger in allowing them to remain in the situation in which they actually were. The minister therefore directed the prefect, in concert with the admiral of the Northern squadron, to make an investigation with the view of certain of the lower plates of the vessels being removed, which, owing to their sinking below the intended water-lines, "had lost part of their value." The directorate of naval constructions at Cherbourg did not, however, share the view of those who advocated the removal of plates, but proposed instead that the lower range of plates should be cut in a particular manner. Trial plates were accordingly sent from Gâvres for experiment, and ultimately plant was laid down at Brest for the work, which had been proved to be practicable. It appears that *rondelles* about two feet in diameter are to be cut out of the plates fore and aft, 50 on each side.—*Army and Navy Gazette.*

Italy.

"CAPRERA": LAUNCH, DESCRIPTION. —The torpedo-gunboat *Caprera* was launched from the yard of Orlando Brothers, Livorno (Leghorn), May 7, 1874. She is built of steel, has a 1-inch protected deck extending from stem to stern, and is of the following dimensions: length, 229 feet 8 inches; beam, 27 feet 5 inches; depth, 18 feet 2 inches; draft, 10 feet 2 inches; displacement, 853 tons. The battery consists of two 4.7-inch R.F.G., four 6-pounder R.F.G., and two 3-pounder R.F.G.; 5 torpedo-tubes are fitted,—one fixed tube in stem and two training tubes on each broadside. The engines are vertical, triple-expansion, of 4000 I.H.P., and expected to give a speed of 21 knots. The coal capacity is 180 tons, and the complement 95 officers and men.

"GOVERNOLO": LAUNCH.—The cruising gunboat *Governolo*, of the *Curtatone* type, modified, was launched at the arsenal, Venice, May 1, 1894. Her dimensions are: length, 185 feet; beam, 28 feet 9 inches; mean draft, 13 feet 9 inches; displacement at this draft, 1255 tons. The anticipated I.H.P. of the engines with natural draft is 1000, and the corresponding speed 12 knots; with forced draft 15 knots is expected. The coal supply is 200 tons. The battery consists of four 4.7-inch R.F.G.; four 6-pounder R.F.G., two forward and two aft; two 1-pounder R.F.G. in the gangways; and two machine guns on the bridge.

"UMBRIA": TRIAL.—The protected cruiser *Umbria*, 2280 tons, has had her 6-hour natural draft trial. The I.H.P. developed was about 5000, and the speed 18 knots. With forced draft 20 knots is expected.

"SARDEGNA": TRIALS. — The first-class battle-ship *Sardegna*, 13,300 tons, has completed her trials. Though the reports are not all in agreement, it seems probable that the speeds developed were 18.5 knots with natural draft and 20 knots with forced draft.

Germany.

NAVAL BUDGET, 1894–95. — The naval budget for the year 1894–95 amounts to about $18,111,000, which is $1,439,000 less than for the present year. The plans of the Admiralty for new construction were upset by the refusal of the Reichstag to grant the necessary credits. The opponents of the increase of the navy, however, grudgingly authorized the commencement of an armored battle-ship of 10,033 tons (type of the *Brandenburg*) to replace the *Preussen*. The new vessel is temporarily designated the *Ersatz Preussen*. The requests for cruisers to replace the *Leipzig* and *Falke* were refused by a strong adverse vote.

The effective force for 1894–95 will be 20,498 officers and men, divided as follows: 877 officers, 112 surgeons, 72 paymasters (*commissaires*), 4428 non-commissioned officers, 14,409 sailors, and 600 boys. A part of the appropriation for new construction is allotted to the completion of the armor-clads *Weissenburg*, *Wörth*, and *Kurfürst Friedrich Wilhelm*, of 10,033 tons each; of the coast-defense armor-clads *Hagen*, *Heimdal*, *T*, and *V*, of 3495 tons; of cruiser *F* and gunboat *H*; and the sum of $265,488 is allotted to the construction of torpedo division boats.

Japan.

NEW ARMOR-CLAD ORDERED.—The Japanese government has ordered two new battle-ships to be built in England,—one from the Thames Ironworks and Shipbuilding Company and the other from Armstrong. They will be of about 12,000 tons. A description, with details, will be given in next month's NOTES.

Chile.

CAPITAN PRAT: ACCEPTED.—Having passed through the guaranteed probationary period without development of defects, the armored cruiser *Capitan Prat* has been definitely accepted by the Chilean government.

Brazil.

CLOSING INCIDENTS OF THE NAVAL REVOLT.

The revolt in Brazil practically terminated with the torpedoing and capture of the *Aquidaban*. By the middle of January, Admiral da Gama had realized that the revolution was a failure. Money and supplies were lacking. Fort Villegagnon, the only regular fortification possessed by the insurgents, was practically destroyed. The movement in the southern Brazilian provinces was not as successful as had been expected, and its leaders and supporters were not in full sympathy with those of the naval revolt. Nor were Admirals da Gama and Mello in entire accord. That the former, at least, at this time recognized the hopelessness of the situation is rendered fairly certain by his actions during and subsequent to the *Detroit* incident. As this affair has been variously and incorrectly described, it may be as well to state what actually occurred.

THE DETROIT INCIDENT.—It must be remembered that the revolutionists were not recognized as belligerents, and therefore did not possess belligerent rights. In the eyes of foreign nations the Brazilian government alone possessed authority. Interference with shipping by other persons would, by a strict construction of international law, be regarded as partaking of the nature of piracy.

Permission to go alongside the wharves had been accorded by the Brazilian government to all foreign merchant vessels when desirous of discharging or taking on cargo; but the revolutionists, in order to prevent the furnishing of supplies to their opponents, refused to permit it. The masters of two American merchantmen, the barks *Amy* and *Glad Tidings*, lying inside of Enxados Island, applied to Admiral Benham for protection while hauling in to the wharf, and their request was granted.

To comply with it, and in anticipation of possible resistance, on the morning of the 29th of January the entire American fleet, consisting of the armored cruiser *New York* (8500 tons) and protected cruisers *Newark* (4080 tons), *San Francisco* (4080 tons), *Charleston* (4040 tons), and *Detroit* (2000 tons), got under way under full head of steam and cleared for action. The *Detroit* left the anchorage and started towards the two barks. The others remained practically together and near their anchorages, moving their engines ahead and astern to keep under control, and the *New York* turning with her head towards the *Aquidaban* lying across the bay. The revolutionist cruiser *Trajano* (1400 tons) lay at anchor a little to the northward of Enxados Island, heading south, and the *Guanabara* (1900 tons) was anchored directly astern of her, heading in the same direction. Near by were the *Liberdade*, flying the flag of Admiral da Gama, and five or six armed tugs. The American barks were between these vessels and the shore,

but not directly in the line of fire. As the *Detroit* came around the south side of Enxados Island, the tugs ran down and opened fire on the wharves. It was returned, and a hot fight was maintained for some little time. As the course of the *Detroit* lay between the tugs, the apparent intention was to head her off. But she stopped her engines below the island and awaited developments. The tugs at length found the firing too hot for them and withdrew. The *Detroit* then started ahead and passed between the barks and the insurgents. The *Amy* now had a boat out running a warping line in to the wharves. After the *Detroit* had passed the *Amy*, and when abreast the *Trajano*, the latter fired a musket shot across the bow of the *Amy's* boat, which made it turn about and return to the ship. The *Amy* then let go her anchor. The *Detroit* had stopped her engines and was drifting along broadside to the *Trajano* at about thirty yards' distance. Immediately following the shot at the *Amy's* boat, she fired a 6-pounder under the *Trajano's* bow. Captain Brownson, of the *Detroit*, then hailed the *Trajano* and said that she had fired on an American ship; that if it was repeated he would return the fire and, if necessary, sink the *Trajano*. He then hailed the *Amy* and told the master to go in to the wharves if he wanted to. The latter said that if he did they would fire on him. Captain Brownson told him to go ahead and he would be protected.

The *Detroit* then forged ahead, and, as she passed beyond the *Trajano's* stern, the latter fired a blank charge to leeward to signify that she would make no further resistance. The breech-blocks of the *Detroit's* guns were then thrown back to avoid possible accidental discharge, and she passed abreast the *Guanabara*. When the *Detroit* had got past her, the *Guanabara* fired a blank charge across the *Amy's* bow. Captain Brownson had previously hailed the *Guanabara* and told her captain not to make any mistake—if he fired on an American vessel the *Detroit* would return the fire and, if necessary, sink him. After the *Guanabara* fired, the *Detroit* ported her helm, rounded to under the *Guanabara's* stern, closed the breech-blocks, and fired a musket ball into her stern-post. The anchor was dropped under foot and she remained in this raking position.

The *Detroit* then sent a boat with an officer to Admiral da Gama, who was on the *Liberdade* a short distance ahead, with the message that his vessels had fired on an American ship and the fire had been returned; and that if it was repeated it would be returned with a general fire. Admiral da Gama replied that if his ships were fired on he would surrender his fleet to the superior force of the United States.

Some messages then passed between Admirals Benham and Da Gama, but as the former communicated to the insurgent commander his unalterable determination to protect American ships which desired to go alongside the wharves, the latter reluctantly accepted the situation and stated that he would no longer interfere with them.

The *Amy* and *Glad Tidings* did not, however, go alongside the wharves. Friends of both sides (insurgent and government) appeared and offered free lighterage to and from the shore, and, to save possible further trouble, they accepted these offers.

Later Events.—A short time after this, the *Aquidaban*, at the request of Admiral Mello, left the harbor and joined his squadron outside. The armed merchant steamers and torpedo craft purchased abroad by President Peixoto were at this time at Pernambuco, and it was supposed that Mello intended to attack them. Instead of this, he proceeded south. Peixoto's vessels came down the coast a few days later, and on March 10 arrived off the entrance to Rio. On Sunday, March 11, a combined attack was to be made by this fleet and the forts on Da Gama's vessels, but at daylight on that morning a white flag was seen flying on his flag-ship. Da Gama then offered to surrender if granted an asylum for himself, officers, and men. This was refused. A day or two later Da Gama and his officers and men abandoned their vessels and took refuge on the foreign men-of-war in the harbor, chiefly on the Portuguese.

TORPEDOING OF THE "AQUIDABAN."—The *Aquidaban*, *Republica*, and the remainder of Mello's squadron were still in the south, either at Rio Grande do Sul or Desterro. The surrender of Da Gama having ended all the fighting in the north, Vice-President Peixoto (his title remained unchanged, although the President had resigned and he performed the duties of President) determined upon sending his improvised squadron down along the coast with the hope of meeting and capturing or destroying Admiral Mello's vessels and so definitely ending the revolution.

Accordingly, on the 8th of April, Admiral Gonçalves got under way with the following craft under his command: *Andrada* (ex-Britannia, ex-America), flag-ship, *Nictheroy* (ex-Cid), the lightly-armed merchant steamers *Itaipu* and *Santos*, the gunboat *Tiradentes*, the torpedo-gunboat *Gustavo Sampaio*, and the German-built sea-going torpedo-boats *Silvado*, *Pedro Affonso*, and *Pedro Ivo*. On the evening of the 11th, Admiral Gonçalves anchored in Porto Bello Bay, about thirty miles above Desterro. It was understood that the *Aquidaban* was near Desterro, but her exact position was unknown, so the *Itaipu* was sent on a scouting expedition to ascertain her exact whereabouts and whether she was accompanied by the other insurgent vessels.

The *Itaipu* discovered her at anchor under the guns of Fort Santa Cruz, a small fortification on Anhatomirim Island, at the northern entrance of Santa Catalina Strait, and returned to Porto Bello to make her report. It appears from what occurred later that the captain of the *Itaipu* mistook the *Aquidaban's* exact position.

It may be as well to say a few words here concerning the locality in which the action took place. The city of Desterro is on the western side of Santa Catalina Island, at the narrowest part of the strait, and about equidistant from its northern and southern entrance. The strait is very shoal. From the south vessels drawing 11 or 12 feet can reach the city, but over the broad flat to the north only 8 or 9 feet can be carried. From the northern entrance, the deep water extends to the southward for a short distance in the shape of a pocket. The 20-foot curve extends close up to the small island of Raton Grande, which is about three miles from Anhatomirim. On the opposite side of the entrance from Fort Santa Cruz is another small fortification, Fort San José, on Santa Catalina Island.

On the 13th of April the fleet got under way, but, as the valves of the *Nictheroy's* pneumatic gun were found to be out of order, it anchored again in Gauchos Camaras Bay (only 6 or 7 miles from the *Aquidaban*) to repair them.

On the night of the 14th the three torpedo-boats, followed by the *Sampaio*, made the first attempt on the *Aquidaban*. In order to keep clear of the torpedo-mines which were said to exist in the channel, they stood too close in to the Catalina shore and were discovered by Fort San José. Their presence was signalled to Fort Santa Cruz and the *Aquidaban*, and, seeing the impossibility of surprising that vessel in an unprepared state, the attempt was given up.

The final and successful attack took place on the night of the 15th–16th. Shortly before midnight the fleet got under way. The *Andrada* and *Nictheroy* took up positions near Francez Island, about two miles from Fort San José. The *Itaipu* and *Santos* lay about the same distance from Santa Cruz, which was their object of attack, and the *Tiradentes* lay between these two positions and divided her favors between the forts. The firing of the vessels was of course ineffectual at such long ranges, and was only intended to distract attention from the torpedo attack; but it is doubtful if it served any good purpose. The ruse was too old and transparent. The commander of the *Aquidaban* knew, from the discovery of the night before, if not from other information, that there were torpedo-boats with the government squadron, and the firing simply notified him that the fleet had arrived in his immediate vicinity. Of course the *Aquidaban* made no attempt to reply to the fire at such long range.

After the bombardment had continued for some time the torpedo fleet was directed to proceed to the attack. The

weather was now beginning to look as if it might prove favorable. During the early part of the night the sky was clear, but it became cloudy about midnight, and towards three o'clock it began to rain.

The *Sampaio* and the torpedo-boats *Silvado* and *Pedro Affonso* (the *Pedro Ivo* being disabled) started out from the fleet between one and two o'clock on the morning of the 16th. Instead of keeping close under Santa Catalina Island and running the risk of again being seen, it was decided to run down the middle of the channel and take the chances of escaping the torpedoes. [It was afterwards discovered that the much-feared cables were dummies and had no torpedoes on them.] After passing Fort San José they followed the shore of Catalina Island, the *Sampaio* leading, keeping in about 20 feet of water and following the shape of the pocket (of deep water, already described) completely around. When headed north again and nearly up to Anhatomirim Island, the *Aquidaban* was discovered directly ahead. The *Sampaio's* bow torpedo was immediately got in readiness. The *Aquidaban* was riding to the tide, head south, and the *Sampaio* passed to the westward of her along her starboard side.

The *Sampaio*, in the mean time, had been sighted from the *Aquidaban*, and almost as soon as she herself was discovered; but she did not at once open fire. The vessels were so close then that those on board of the torpedo-vessel distinctly heard Captain Alencar, on the *Aquidaban*, call out, "Don't fire. It is the steamer from Desterro." (It appears that they were expecting a steamer with supplies.) A moment later the true character of the *Sampaio* was made out, and the *Aquidaban* then opened with all available guns.

Having decided that his weak battery could play no important part in the action and might distract the men from their more important duties with the torpedoes, Lieutenant Correa, commanding the *Sampaio*, made the crew lie flat on the deck or go below. When nearly abreast the *Aquidaban's* bow, Correa put his helm over to bring the bow torpedo-tube to bear. At the same time, through a speaking-tube, he told the officer at the starboard training-tube to prepare it for use. This order was indistinctly heard by the officer at the bow torpedo, and in the excitement of the moment he mistook it for an order to fire his torpedo, which he promptly did. Of course it went wide of the mark. A moment later he received the actual order to fire, when he informed the commanding officer that he had already done so. Correa then backed off a little and turned to bring his starboard torpedo to bear. It was not ready for firing and his vessel was drifting down with the tide, so Correa brought her around the *Aquidaban's* stern and ranged slowly up along her port side at about 60 yards' distance. When abreast her bow the torpedo was reported ready and immediately fired. It struck the *Aquidaban* under the bow between the forward turret and the stem. The explosion seemed to lift her bodily on the top of a smooth, unbroken wave. The *Sampaio* then started away at full speed. The other two torpedo-boats fired one or two torpedoes each, but as the injuries were all on the port bow, and as the boats were on her starboard side, their torpedoes could not have reached their mark. The surprising part is that they did not strike the *Sampaio*.

It is not known exactly what guns the *Aquidaban* used. Those in the turrets were not brought into action, as there was found to be insufficient steam to work them. The only projectiles which struck the *Sampaio* were from 1-inch Nordenfeldts. Twenty-four of these struck in various parts of the vessel,—all but one or two on the starboard side. Neither the conning tower nor the torpedo-tubes were struck. Two struck a 3-pounder Hotchkiss R.F.G., one over the housing of the breech-block and one over the powder-chamber. The penetration was about an inch, and both projectiles rebounded. The gun was not injured sufficiently to put it out of action, though a slight bulge on the inside of the housing caused the breech-block to work very stiffly. It was easily removed with a file and emery cloth.

The *Aquidaban* was not taken possession of until the 17th. When boarded she was found to be deserted. Her bow

was depressed two or three feet and rested lightly on the bottom. A sail or awning had been drawn around the bow under the bottom, with the evident intention of attempting to stop the leak. The two forward compartments were full of water. but none was found abaft the bulkhead just forward of the forward loading station of the turret.

The *Aquibaban* was towed to Rio and placed in dry-dock. It was then discovered that she had an enormous hole in her port bow, about 32 feet in greatest length and 14 feet in greatest width. The torpedo had apparently struck the port side between the sixth and seventh frames. The force of the explosion had driven some heavy article or piece of metal through the plating on the starboard side, making a hole about 2 feet in diameter. The injuries were entirely confined to the part of the hull below the protective deck (which was intact), and they extended aft to the twelfth frame, at which was the second water-tight bulkhead. This also was uninjured.

After failing to establish himself at Rio Grande do Sul, Mello apparently gave up the contest, and, leaving Alencar on the *Aquidaban*, to fight, surrender, or escape as best pleased him, he proceeded to Uruguay, where he landed several hundred ex-soldiers and sailors as refugees and without arms. As the Uruguayan authorities were going to give him some trouble about the matter, he went on to Buenos Ayres Roads and turned over his remaining ships, which consisted of the *Republica* and three or four armed merchant steamers, to the Argentine authorities. And they were, by the Argentines, given up to Admiral Gonçalves a few days later.

After taking possession of the *Aquidaban* and *Republica* the government rechristened them the *Twenty-fourth of May* (the day she was towed into Rio after capture) and the *Fifteenth of November* respectively,—double-barreled monstrosities in the way of names that seem to be popular in South American countries.

United States.

"ERICSSON": LAUNCH, DESCRIPTION.—The sea-going torpedo-boat *Ericsson* was launched at Dubuque, Iowa, May 12, 1894. Her dimensions are: length on the water-line, 150 feet; beam, 15 feet 6 inches; mean draught, 4 feet 9 inches; displacement, 120 tons. The engines are twin-screw, vertical, quadruple expansion, designed to develop 1800 I.H.P. and a speed of 24 knots. There are three torpedo-tubes, one fixed tube forward and two training tubes. The fixed tube is fitted for the Howell torpedo and the training tubes for the Whitehead. Four 1-pounder R.F.G. are mounted.

"NEW YORK": DEFECTS.—The newspaper reports of the defects in the armored cruiser *New York* have greatly exaggerated them. As might be expected, certain of her fittings were found susceptible of improvement, but so long as fallible mortals have charge of the construction and design of ships they will not be wholly perfect. When opportunity offers, certain slight changes will be made in the turret machinery and ammunition hoists which will overcome the difficulties complained of.

"MONTEREY": BEHAVIOR AT SEA.—The report of Captain Kempff, of the *Monterey*, states that her turrets can be worked and fought in any ordinary seaway. The advantage of a fixed barbette about the base of the turret is distinctly noticeable, for the water may be several feet deep on deck without leaking into the turret chamber. In the *Miantonomoh* and *Terror*, when the water is a foot deep around the base of the turret the latter cannot be revolved without allowing the water to leak in around the packing ring. The maximum roll observed on board the *Monterey* in heavy weather, while running with the sea on the beam or quarter, was 21 degrees, as determined by battens. The average roll was 2 to 3 degrees in ordinary weather, and the period of double roll 6 seconds. The *Miantonomoh's* period of double roll is about 5 seconds. A peculiarity of the rolling of these vessels is that the period of rest at the end of the roll is almost wholly wanting. The strong righting power starts the ship to return as soon as the rolling moment is absorbed.

HEAVY GUNS AND MOUNTS.

WILLSON DISK GUN: DESCRIPTION.—This system of construction is the invention of Mr. Thomas Willson, the electrical engineer, of New York, and the following description is derived from an article by Lieutenant-Commander Ingersoll in the *Proceedings of the United States Naval Institute.*

The tube is of steel of the usual form and characteristics. Around it, for about two-thirds the length, are shrunk thin steel disks of very high-grade steel, prepared by a process of cold rolling which gives an elastic strength of 100,000 pounds per square inch. In the larger calibres the disks may be extended to the muzzle, if considered desirable. Over the disks and tube, for the full length of the gun, is cast an aluminum-bronze jacket. Aluminum-bronze is selected for the jacket on account of the simplicity of manufacture combined with low cost. But a forged steel jacket, in three pieces locked together, could be substituted. That the casting of the aluminum jacket about the gun will not injure the steel of the disks has been demonstrated experimentally on a small scale. The only effect on the metal is to anneal it. Good aluminum-bronze castings can be had with a guaranteed elastic strength of 30,000 pounds per square inch. The breech-block works in a hoop shrunk on the rear end of the tube and locked and supported by the jacket.

WOODBRIDGE WIRE-WOUND GUN: BURSTING OF.—The fact of the bursting of the Woodbridge, 10-inch, wire-wound gun at Sandy Hook, about a year ago, was not made public for some months. While testing some powder that was to be used in making the official trial of the gun, the tube cracked so badly as to render the gun unserviceable. The charge used was 235 pounds of Du Pont's brown prismatic. The tube apparently lacked support from the wire winding.

This gun "consists of a continuous steel tube, overlaid throughout its rear half with a cylinder of closely-fitted steel staves, the whole wound with tinned steel wire, soldered or brazed in an oven. The whole length of the gun is divided into three sections by steel rings or bands, and forward of the staves the wire is wound directly on the steel tube. It weighs 30 tons; is 27 feet long; the projectile weighs 600 pounds. The staves were annealed at the Washington Navy-Yard. They were 24 feet long, 4 inches square, and weighed 1290 pounds each. The tension of the wire of the Woodbridge gun is adjusted and automatically regulated by a wire-tension apparatus patented by Dr. Woodbridge in 1885. The tensions of winding for the different layers are intended to give, when the interior pressure shall reach a little more than 80,000 pounds per square inch, an extension to the wire overlying the chamber, in all its parts, equal to that due to a tension of 100,000 pounds per square inch in a 'free' wire."

SMALL-ARMS AND EQUIPMENTS.

BRITISH MARINES: RE-ARMING OF.—The Secretary of the British Admiralty has stated in Parliament that arrangements have been made for arming the marines with the new magazine rifle during 1894–95.

GERMAN INFANTRY SOLDIER'S EQUIPMENT: REDUCTION IN WEIGHT.—The German military authorities expect to be able to reduce the number of cartridges carried by each man into battle from the present number, 150, to 120, relying upon improvement in the ammunition supply train to provide the remainder as needed. It is said that the French carry 120, the Austrians 100, the Italians 96, and the Russians 84. It is also proposed to carry the day's ration of tinned vegetables in the provision column. It is hoped to lighten the metal parts of the uniform and equipments with aluminum, and the stiff collar of the tunic will be converted into a collar which can be folded down in hot weather, while it can be buttoned up as a protection from cold. A pack of some sort will probably be substituted for the knapsack. It is thus hoped to bring the total weight of clothing and equipment of the German infantryman down from 72.8 pounds to 57.5 pounds. Furthermore, the present

bayonet will be superseded by a new model weighing between 400 and 500 grammes less; the belts, etc., will be made of narrower leather; the number of intrenching tools will be reduced to 50 spades, 10 pickaxes, and 5 hatchets per company, which will be carried by the strongest men; and the overcoats will not be so heavily padded as heretofore. Major Scheibert, who served on the Confederate side during the Rebellion, points out in the *Kreuz Zeitung* that no modern campaigns have been so rich in practical lessons upon equipment and supply as those of the American Civil War.

A NEW BULLET-PROOF CLOTH.—An Englishwoman, Miss Julia Maynard, who is said to be an expert rifle shot, has invented a bullet-proof cloth which, according to report, rivals that of Herr Dowe. She has had a dress made of the material, and it is claimed that, while it is neither cumbersome nor heavy, it is scarcely distinguishable from ordinary apparel. This cloth is not only impervious to bullets, but also to swords, bayonets, etc. (The above statements are derived from English papers. To say that they are doubtful hardly expresses the editor's views on the subject.)

NEW DUTCH MILITARY RIFLE: DESCRIPTION, ETC.—The commission charged with deciding upon a small-calibre rifle for the Netherlands home and colonial forces concluded to recommend the adoption of a 6.5 millimetre Mannlicher. One hundred of these rifles were consequently served out for experiment by three regiments of infantry and another hundred for experiment in the colonies. The result of the trials, which were of an exhaustive character, has proved most satisfactory, and the Dutch government has consequently decided to adopt definitely this arm for all their troops, and the manufacture has been intrusted to the factory at Steyr. The following are authentic particulars concerning the new weapon:

Weight of the rifle with the sword bayonet	4.5	kilos	= 10.02	pounds.
" " " without " "	4.1	"	= 9.02	"
Length " " " " "	1.28	metres	= 4.2	feet.
" " " barrel	0.79	"	= 2.59	"
" " rifled portion	0.727	"	= 2.38	"
Number of riflings (grooves)	4			
Depth " " "	0.15	mm.	= 0.0059 inch.	
Pitch " " "	200	"	= 7.874 inches.	

The barrel is covered with a casing of wood. The sight is graduated from 400 to 2100 metres. The cartridge is furnished with a rim, and its length is 77.6 mm. (3.05 in.) and its weight is 22.45 grammes (346.36 grains). The bullet is of hardened lead encased with nickel; its weight is 10.05 grammes (155 grains); its diameter 6.7 mm (.264 in.); and its length 34.5 mm. (1.36 in.) The charge consists of 2.35 grammes (36.27 grains) of Troisdorf smokeless powder, which gives a muzzle velocity of 700 metres (2297 feet). The magazine can take 5 cartridges. It is stated that the properties of the Dutch Mannlicher are superior to those of the 1888 model. Some comparative experiments have shown that the Dutch weapon will send a bullet 69 centimetres (27.2 in.) into a block of beechwood placed at a distance of 12 metres (39.4 feet) from the muzzle, while the German rifle only effects a penetration of 50 to 56 centimetres (19.7 to 22 in.). At a range of 2500 metres the former weapon gave a penetration of 11 cm. (4.3 in.), while the latter only gave 5 cm. (1.97 in.) penetration.—From *Arms and Explosives*, with additions and corrections by the editor of the NOTES.

L. S. VAN DUZER,
Lieutenant U.S.N.

SERVICE SALAD.

The Real Japanese.

(From the New York Sun.)

We are indebted to Messrs. Houghton, Mifflin & Co. for a singularly timely and useful publication, "Glimpses of Unfamiliar Japan," by Lafcadio Hearn. Few men could be better qualified than is the author in respect of aptitudes, abilities, and opportunities, to discuss the subject. He is at once a scholar and an artist, and one must needs be both to interpret the Japanese. In the capacity of teacher, he dwelt for more than four years among the people, and this book, which has no rival in its field, demonstrates that his sojourn was exceptionally fruitful. One should understand at the outset that it is not the primary aim of the author to discuss the educated classes of new Japan. In them there is but little novelty, outside of the closeness with which they have assimilated European ideas. Mr. Hearn does not concur with other observers when he says that, except as regards a characteristic indifference towards abstract ideas in general and metaphysical speculation in particular, the Occidentalized Japanese of to-day stands almost on the intellectual plane of the cultivated Parisian or Bostonian. Not in the Europeanized circles of the country is to be found the rare and distinctive charm of Japanese life. That must be sought for among the great mass of the common people, who represent the national virtues, and who still cling to their old customs, their picturesque dresses, their Buddhist images, their household shrines, their beautiful and touching worship of ancestors. This is the life of which a foreign observer never wearies, the life that forces him, at times, to doubt whether the course of Western progress is really in the direction of moral development. The author of this book assures us that each day, as years rolled on, there was revealed to him some unsuspected beauty in it. No doubt, like other lives, it has its darker side, but even this is described as brightness compared with the darker side of Western existence. It has its foibles, follies, vices, and cruelties; yet the more one sees of it the more one marvels at its extraordinary goodness, miraculous patience, never-failing courtesies, simplicity of heart, and intuitive charity. How much the lighter and kindlier superstitions of the people add to the attractiveness of life in Japan can, it is said, be understood only by one who has long resided in the interior. A few of their beliefs are sinister, such as that in demon foxes; but a large number are compared for beauty of fancy to those Greek myths in which the European poets of to-day still find inspiration, and many others, which encourage kindness to the unfortunate and kindness to animals, can never have produced any but the happiest moral results. The amusing presumption of domestic animals in Japan, and the comparative fearlessness of many wild creatures in the presence of man; the white clouds of gulls that hover about each incoming steamer, in expectation of an alms of crumbs; the whirring of doves from temple eaves to pick up the rice scattered for them by pilgrims; the familiar storks of ancient public gardens; the deer of holy shrines awaiting cakes and caresses; the fish which raise their heads from sacred lotos ponds when the stranger's shadow falls upon the water,—these and a hundred other pretty sights are ascribed to fancies which, though called superstitious, inculcate in the simplest form the sublime truth of the unity of life. After living four years in the country, Mr. Hearn

affirms that, except where native morals have suffered by foreign contamination, as in the open ports, the words are still true of the Japanese which were penned by Kaempfer more than one hundred and sixty years ago: "In the practice of virtue, in purity of life and outward devotion, they far outdo the Christians." The author's own conviction is, and it agrees with that of many impartial and experienced observers, that Japan has nothing to gain by conversion to Christianity, either morally or otherwise, but very much to lose.

I.

First impressions are valuable, when he who experiences them has the sensitive organization of a poet, and much of a poet's faculty for description. We are glad, therefore, that Mr. Hearn has succeeded in recalling his first impression of a Japanese town. He tells us that everything seemed elfish, for everything, as well as everybody, was small and queer and mysterious; the little houses under their blue roofs, the little shop fronts hung with blue, and the smiling little people in their blue costumes. At first you only get, we are told, as you look down a Japanese street, the sense of a delightfully odd confusion, through an interminable flutter of flags and swaying of dark-blue drapery, all made beautiful and mysterious with Japanese or Chinese letters. There are no immediately discernible laws of construction or decoration; each building seems to have a fantastic prettiness of its own; nothing is exactly like anything else, and all is bewilderingly novel. Gradually, however, the eye begins to recognize in a vague way some general plan in the construction of the low, light, queerly gabled wooden houses, mostly unpainted, with their first stories all open to the street, and thin strips of roofing sloping above each shop front like awnings back to the miniature balcony of the paper-screened second story. You begin to understand the common plan of the tiny shops, with their matted floors well raised above the street level, and the general perpendicular arrangement of sign-lettering, whether undulating on drapery or glimmering on gilded and lacquered sign-boards. You observe that the same rich dark blue which dominates in popular costumes rules also in shop drapery, though there is a sprinkling of other tints, bright blue and white and red; no greens or yellows. You note also that the dresses of the laborers are inscribed with the same wonderful lettering as the shop draperies. As modified for decorative purposes, these ideograms are said to have a speaking symmetry which no design without a meaning could possess. As they appear on the back of a workman's frock, pure white on dark blue, and large enough to be easily read at a great distance (indicating some guild or company of which the wearer is a member or employee), they give to the poor cheap garment a factitious appearance of splendor. Finally, there will come to you like a revelation the knowledge that most of the amazing picturesqueness of these streets is simply due to the profusion of Chinese and Japanese characters in white, black, blue, or gold, decorating everything, even the surfaces of door-posts and paper screens. If, then, for a moment, one imagines the effect of English lettering substituted for the national characters, the mere idea will give to whatever æsthetic sentiment one may possess a brutal shock, and one will become, as Mr. Hearn tells us that he became, an enemy of the Romaji-Kwai, the society founded for the ugly utilitarian purpose of introducing the use of English letters in writing Japanese.

The curious æsthetic effect of the all-pervasive Japanese lettering seems to require further explanation, and the author gives it. He says that an ideogram does not make upon the Japanese brain any impression similar to that created in the Occidental brain by a letter or combination of letters, the dull inanimate symbols of sound. To the Japanese brain, the ideogram is a vivid picture; it lives, it speaks, it gesticulates. The whole space of a Japanese street is full of such living characters,—figures that cry out to the eye, words that smile or grimace like faces. What such lettering is compared with our own lifeless types can be understood only by those who have lived for a considerable

period in the farther East. Even the printed characters of Japanese or Chinese imported texts give no suggestion of the possible beauty of the same characters as modified for decorative inscription, for sculptural use, or for the commonest advertising purposes. No rigid convention fetters the fancy of the calligrapher or designer; each tries to make his character more beautiful than any other; and generations of artists have been toiling with like emulation, so that, through centuries of tireless effort and study, the primitive hieroglyph or ideogram has been evolved into a thing of beauty indescribable. It consists, to be sure, only of a certain number of brush strokes; but in each stroke there is an undiscoverable secret art of grace, proportion, imperceptible curve, which actually makes it seem alive, and bears witness that even during the lightning moment of its creation the artist felt with his brush for the ideal shape of the stroke equally along its entire length from head to tail. Nor is the art of the stroke all; the art of their combination is that which produces the enchantment often so as to astonish the Japanese themselves. Mr. Hearn found it not surprising, considering the strangely personal, animate, esoteric aspect of Japanese lettering, that there should be wonderful legends of calligraphy, relating how words written by holy experts became incarnate, and descended from their tablets to hold converse with mankind.

II.

It is not uncommon to hear practical Americans say, on reading of a great fire in Japan, "Those people can afford fires; their houses are so cheaply built." On this current remark the author makes the following comment: "It is true," he says, "that the frail wooden houses of the common people in Japan can be cheaply and quickly replaced; but that which was within them to make them beautiful cannot, and the result is that every fire is an art tragedy. Japan, in other words, is the land of infinite hand-made variety; machinery has not yet been able to introduce sameness and utilitarian ugliness in cheap production, except in response to foreign demand for bad taste to suit vulgar markets; each object made by the artist or artisan still differs from all others, even of his own making. Consequently, each time something beautiful perishes by fire, it is a something representing an individual idea." Happily, the art impulse itself in this country of conflagrations has a vitality which survives each generation of artists, and defies the flame that changes their labor to ashes or melts it to shapelessness. Strangely significant of the absence of machine-made uniformity is the fact recorded by Mr. Hearn, that of every pair of Japanese wooden clogs, one makes in walking a slightly different sound from the other, as kring to krang; so that the echo of the walker's steps has an alternate rhythm of tones. From the clogs one naturally passes to the feet that wear them, and we are invited to notice how small and shapely the feet of the people are, whether bare brown feet of peasants or beautiful feet of children wearing tiny geta, or feet of young girls in snowy tabi. The tabi, the white digitated stocking, gives to a small light foot a mythological aspect, the white, cleft grace of the foot of a fauness. Clad or bare, the Japanese foot has the antique symmetry; it has not yet been distorted by the footgear which deforms the feet of Occidentals.

The supremely pleasurable impression made on the foreign observer, however, is that produced by the singular gentleness of popular scrutiny. Everybody looks at you curiously, but there is never anything disagreeable, much less hostile, in the gaze; most commonly it is accompanied by a smile or half smile. The ultimate consequence of all these kindly curious looks and smiles is that the stranger finds himself thinking of fairyland. Though the expression may seem hackneyed, there is, it seems, a good reason for the unanimity in choice of terms to describe what it would be almost impossible to depict more accurately at the first essay. To find one's self suddenly in a world where everything is upon a smaller and daintier scale; a world of lesser and seemingly kindlier beings, all smiling at you and seeming to wish you well; a world where all movement is slow and soft, and voices are

hushed; a world where land, life, and sky are unlike all that one has known elsewhere,—this is truly the realization of the dream of a world of elves.

Why is it, asks the author, lingering on the elements of beautiful unlikeness, that the trees are so lovely in Japan? In Europe or the United States a plum- or cherry-tree in flower is not an astonishing sight, but in Japan it is a miracle of beauty so bewildering that, however much you may have previously read about it, the real spectacle strikes you dumb. You see no leaves, only one great filmy mist of petals. Is it, asks Mr. Hearn, that the trees have been so long domesticated and caressed by man in this land of the gods that they have acquired souls, and strive to show their gratitude, like women beloved, by making themselves more beautiful for man's sake? Assuredly they have mastered men's hearts by their loveliness, like beautiful slaves,—that is to say, Japanese hearts. Apparently, there are some foreign tourists of the brutal class to be apprehended, since it has been deemed necessary here and there to set up inscriptions in English announcing that it is forbidden to injure the trees.

III.

What is the secret of the deep and abiding ethical influence of Shintoism, the prehistoric and national religion of Japan? We find a more satisfactory answer to this question in the book before us than elsewhere. It is true enough that, except in the works of such men of special erudition as Chamberlain and Satow, works with which an Occidental reader, unless himself a specialist, is unlikely to become familiar, little has been written in English about Shinto which gives an intelligible idea of what Shinto is. It seems that Mr. Satow himself acknowledges that even for him it is still difficult to reply definitely to the question, What is the nature of Shinto? How is one to define the common element in the six kinds of Shinto which are known to exist, and some of which no foreign scholar has yet been able to examine for lack of time or of authority or of opportunity. Even in its modern external form Shinto is sufficiently complex to task the united powers of the historian, philologist, and anthropologist merely to trace out the multitudinous lines of its evolution, and to determine the sources of its various elements. These include primeval polytheism and fetichism, traditions of Turanian origin, philosophical concepts from China, Corea, and elsewhere, all mingled with Buddhism, Taoism, and Confucianism. Even more likely to fail is the effort to find the relation of Shintoism to the national ethics by mere historical and philological analysis; as well seek to define the ultimate secret of life by enumerating the elements of the body which it animates. Not until the result of such scholarly efforts shall have been closely combined with a deep knowledge of Japanese thought and feeling can all that Shinto is be fully comprehended. Something, nevertheless, of what it signifies in the simple poetry of its beliefs, the home training of the child, and the worship paid by filial piety before the tablets of ancestors, may be learned during a residence of some years in Japan by one who lives the life of the people and adopts their manners and customs. It is because he has had such an experience that the author of this book claims the right to possess at least his own conception of Shintoism. The conviction of the author is that the marvelous vitality of Shintoism is due to the fact that in the course of its long development out of unrecorded beginnings, it became at a very ancient epoch, and still remains, a religion of the heart. Whatever be the origin of its rites and traditions, its ethical spirit has become identified with all the deepest and best emotions of the race. The secret living force of Shintoism to-day, the force which repels missionary efforts at proselytizing, means something much more profound than tradition, or worship, or ceremonialism. It is suggested that Shinto may yet, without loss of real power, survive all these. No doubt the expansion of the popular mind through education and the influence of modern science must compel abandonment or modification of many ancient Shinto conceptions; but the ethics of Shinto, it is predicted, will endure. For Shinto

signifies character in the highest sense; courage, courtesy, honor, and, above all things, loyalty. The spirit of Shinto is the spirit of filial piety, the zest of duty, the readiness to surrender life for a principle, without a thought of wherefore. It constitutes the docility of the Japanese child, the sweetness of the Japanese woman. It likewise constitutes conservatism, the wholesome check upon the national tendency to cast away the work of the entire past in rash eagerness to assimilate too much of the foreign present. From another point of view, it may be described as religion transformed into hereditary moral impulse, religion transmuted into ethical instinct. It constitutes in fine the whole emotional life of the race, the soul of Japan. Evidently the author is no Weismannist, for he avers that the Japanese child is born Shinto. Home teaching and school training only give expression, he thinks, to what is innate: they do not plant new seed; they do but quicken the ethical sanse, transmitted as a trait ancestral. Even as a Japanese infant inherits such ability to handle a writing-brush as never can be acquired by Western fingers, so does it inherit ethical sympathies totally different from our own. Ask a class of Japanese students, young men of fourteen to sixteen, to tell their dearest wishes, and, if they have confidence in the questioner, perhaps nine out of ten will answer, "To die for his Majesty our emperor." How much this sense of loyalty has been weakened in such great centres as Tokio by the new agnosticism and the rapid growth of other nineteenth century ideas among the student class, Mr. Hearn will not pretend to say; but he affirms that in the country it remains as natural to boyhood as joy. Unreasoning it also is, unlike the loyal sentiments of modern Europeans, which are the result of mature knowledge and settled conviction. Never does the Japanese youth ask himself why; the duty of self-sacrifice is the all-sufficing motive. Such ecstatic loyalty is a part of the national life; it is, Mr. Hearn asserts, in the blood, inherent as the impulse of the ant to perish for its little republic, unconscious as the loyalty of bees to their queen. The readiness to sacrifice one's own life for loyalty's sake, for the sake of a superior, for the sake of honor, seems to have been a national characteristic from the earliest period of Japan's independent existence. Long before the epoch of established feudalism, when honorable suicide became a matter of rigid etiquette, not for warriors only, but even for women and little children, the giving one's life for one's prince, even when the sacrifice could avail nothing, was held a sacred duty. An impressive instance is cited from an early period. But thousands of equally strong examples could be quoted from later Japanese history, including many which have occurred within the memory of the living. Nor was it for persons alone that to die might become a sacred duty; in certain contingencies, conscience held it scarcely less a duty to die for a purely personal conviction, and he who held any opinion which he believed of paramount importance would, when other means failed, write his views in a letter of farewell, and then take his own life, in order to call attention to his beliefs and to prove their sincerity. Such an instance took place in 1891 in Tokio, when a young lieutenant of militia killed himself by hari-kari in a cemetery, leaving a letter stating, as the reason for his act, his wish to force public recognition of the danger to Japanese independence from the growth of Russian power in the North Pacific. A much more touching sacrifice in May of the same year, a sacrifice conceived in the purest and most innocent spirit of loyalty, was that of the young girl Yoko Hatakeyana, who, after the attempt was made to assassinate the Czarewitch, traveled from Tokio to Kyoto, and there killed herself merely as a vicarious atonement for the incident which had caused shame to Japan and grief to his Sacred Majesty, the emperor.

IV.

Mr. Hearn tells us that just before his departure for the interior one of his Yokohama friends said to him, "Since you are going to study Japanese life, perhaps you will be able to find out something for me. I can't understand the Japanese smile." Neither at that

time could the author; but it seems that ultimately the meaning of this ubiquitous and mysterious phenomenon was revealed to him. A Japanese can smile in the teeth of death, and usually does. But he then smiles for the same reason that he smiles at other times. There is neither defiance nor hypocrisy in his smile; nor is it to be confounded with the smile of sickly resignation which we are apt to associate with weakness of character. It is an elaborate and long cultivated etiquette. It is also a silent language. But any effort to interpret it according to Western notions of physiognomical expression would be no more successful than an attempt to interpret Chinese ideograms by their real or fancied resemblance to shapes of familiar things. To comprehend the Japanese smile one must be able to enter a little into the ancient, natural, and popular life of the country. Mr. Hearn found that from the modernized upper classes nothing was to be learned. It is to the still fluid, mobile, natural existence of the common people that one must look for the meaning of some apparent differences in the race feeling and emotional expression of the West and the far East. With these gentle, kindly, sweet-hearted folk, who smile at life, love, and death alike, it is possible to enjoy community of feeling in simple, natural things; and by familiarity and sympathy one can learn why they smile.

It is the conviction of the author, who, being, as we have said, no Weismannist, believes in the transmission of acquired characters, that the Japanese child is born with this happy tendency, which is fostered through all the period of home education. But it is cultivated with the same exquisiteness that is shown in the cultivation of the natural tendencies of a garden plant. The smile is taught, like the bow; like the prostration; like the little sibilant, sucking in of the breath which follows as a token of pleasure the salutation to a superior; like all the elaborate and beautiful etiquette of the old-time courtesy. Laughter is not encouraged, for obvious reasons. But the smile is to be used upon all pleasant occasions when speaking to a superior, or to an equal, and even upon occasions which are not pleasant; it is a part of deportment. The most agreeable face is the smiling face, and to present always the most agreeable face possible to parents, relatives, teachers, friends, and well-wishers, is a rule of life. It is, furthermore, a rule of life to turn constantly to the outer world a mien of happiness, to convey to others as far as possible a pleasant impression. Even though the heart is breaking, it is a social duty to smile. On the other hand, to look serious or unhappy is rude, because this may cause anxiety or pain to those who love us; it is likewise foolish, since it may excite unkindly curiosity on the part of those who love us not. Cultivated from childhood as a beauty, the smile soon becomes instinctive. In the mind of the poorest peasant lives the conviction that to exhibit the expression of one's personal sorrow or pain or anger is rarely useful and always unkind. Hence, although natural grief must have in Japan, as elsewhere, its natural issue, an uncontrollable burst of tears in the presence of superiors or guests is an impoliteness; and the first words of even the most unlettered countrywoman, after the nerves have given way in such a circumstance, are invariably, "Pardon my selfishness, and that I have been so rude." According to Mr. Hearn, moreover, the reasons for the smile are not only moral; they are, to some extent, æsthetic; they partly represent the same idea of temperateness or moderation which regulated the expression of suffering in Greek art. But they are much more moral than æsthetic.

V.

It seems that from this primary etiquette of the smile there has been developed a secondary etiquette, the observance of which has frequently impelled foreigners to form cruel judgments as to Japanese sensibility. It is the native custom that whenever a painful or shocking fact must be told, the announcement should be made by the sufferer with a smile, though, of course, the reverse rule is observed in condoling with the sufferer. The graver the subject, the more accentuated the smile; and when the matter is very unpleasant to the person speaking of it, the smile often changes to a low,

soft laugh. However bitterly the mother who has lost her first-born may have wept at the funeral, it is probable that, if in your service, she will tell of her bereavement with a smile. Like the Israelite preacher, she holds that there is a time to weep and a time to laugh. The author says that it was long before he could understand how it was possible for those whom he believed to have loved a person recently dead to announce that death with a laugh. Yet the laugh was politeness carried to the utmost point of self-abnegation. It signified: "This you might honorably think to be an unhappy event; pray do not suffer your superiority to be concerned about so inferior a matter, and pardon the necessity which causes us to outrage good manners by speaking about such an affair at all." In a word, the key to the mystery of the most unaccountable smiles of the Japanese is their politeness. The servant sentenced to dismissal for a fault prostrates himself, and asks for pardon with a smile. His smile indicates the very reverse of callousness or insolence; it means, "Be assured that I am satisfied with the great justice of your honorable sentence, and that I am now aware of the gravity of my fault. Yet my sorrow and my necessity have caused me to indulge the unreasonable hope that I may be forgiven for my great rudeness in asking pardon." The youth or girl, beyond the age of childish fears, when punished for some error, receives the punishment with a smile, which says, "No evil feeling arises in my heart; much worse than this my fault has deserved." It should be understood, however, that the poorest and humblest Japanese is rarely submissive under injustice. His apparent docility is due chiefly to his moral sense. The foreigner who strikes a native for sport may have reason to find that he has made a serious mistake. The Japanese are not to be trifled with, and brutal attempts to trifle with them have cost several worthless lives.

The smile which illuminates Japanese conversation is in itself but a small detail of the traditional courtesy. We are told that, if you happen to have a Japanese friend who has remained in all things truly Japanese, you will observe that, as a rule, he never speaks of himself, and that, in reply to searching personal questions, he will answer as vaguely and briefly as possible with a polite bow of thanks. On the other hand, he will ask many questions about yourself; your opinions, your ideas, even trifling details of your daily life, appear to have deep interest for him; and you will probably have occasion to note that he never forgets anything which he has learned concerning you. There are, at the same time, certain rigid limits to his kindly curiosity, and, perhaps, even to his observation; he will never refer to any disagreeable or painful matter, and he will seem to remain blind to eccentricities or small weaknesses, if you have any. To your face he will never praise you, but he will never laugh at you nor criticise you. Indeed, you will find that he never criticises persons, but only actions and their results. As a private adviser, he will not even directly criticise a plan of which he disapproves, but is apt to suggest a new one in some such guarded language as, "Perhaps it might be more to your immediate interest to do thus and so." When obliged to speak of others he will refer to them in a curious, indirect fashion by citing and combining a number of incidents sufficiently characteristic to form a picture. But in that event the incidents narrated will almost certainly be of a nature to awaken interest and to create a favorable impression. This indirect way of conveying information is essentially Confucian. "Even when you have no doubts," says the Li-Ki, "do not let what you say appear as your own view." Mr. Hearn thinks that any one may notice many other traits in the Japanese requiring some knowledge of the Chinese classics to comprehend. No such knowledge, however, is necessary to convince you of their exquisite consideration of others and their studied suppression of self. Among no other civilized people is the secret of happy living so thoroughly recognized; by no other race is the truth so widely understood that our pleasure in this life must depend upon the happiness of those above us, and consequently on the cultivation in ourselves of unselfishness and patience. For this reason, in Japanese

society, sarcasm, irony, and cruel wit are not indulged; indeed, they scarcely have any existence in refined life. A personal failing is not made the subject of ridicule and reproach; an eccentricity is not commented upon; an involuntary mistake excites no laughter. In fine, Mr. Hearn agrees with Sir Edwin Arnold in affirming that, in the mind of one who even partly understands the Japanese, there can remain no doubt that they are the best people in the world to live among. The intellectual loss, if there be any, is more than compensated by the social charm.

VI.

In a chapter of this volume the author discusses with exceeding delicacy and grace a questionable feature of Japanese civilization. We refer to the so-called geisha, or dancing girls, who at banquets dance and sing, pour the wine, and, in all ways attractive yet decorous, minister to the entertainment of the guests. They do not appear, it seems, until several dishes have been emptied and several cups of saké have been absorbed. Then, all at once, with a little burst of laughter, a number of young girls enter, make the customary prostration of greeting, glide into the open space between the ranks of the guests, and begin to serve the wine with a grace and dexterity of which no common maid is capable. They are pretty; they are clad in very costly robes of silk; they are girdled like queens; and the beautifully dressed hair of each is decked with fresh flowers, with wonderful combs and pins, and with curious ornaments of gold. They greet the stranger as if they had always known him; they jest, laugh, and utter funny little cries. Some form an orchestra; others, singly or in pairs, perform the dance. It may be swift and merry, consisting wholly of graceful posturing, but more frequently it is rather like acting than like what we call dancing,—acting accompanied with extraordinary waving of sleeves and fans, and with a play of eyes and features, sweet, subtle, subdued, wholly Oriental. There are more voluptuous dances known to the geisha, but, upon ordinary occasions, and before refined audiences, they portray for the most part beautiful Japanese traditions, at intervals singing ancient Chinese choruses which express a natural emotion with a few exquisite words. It is further to be noted that, notwithstanding all the apparent comradeship which is soon established between guest and geisha, a certain rigid decorum is invariably preserved at a Japanese banquet. However flushed with wine a native guest may have become, you will never see him attempt to caress a girl; he never forgets that she appears at the festivities only as a human flower,—to be looked at, not to be touched. The familiarity which foreign tourists in Japan frequently permit themselves with geishas, or with waiter girls, though endured with smiling faces, is really much disliked, and considered by native observers an evidence of extreme vulgarity.

VII.

Such is the geisha's *rôle;* but what is her veritable existence beyond the circle of the banquet life; what are her thoughts, her emotions, her secret self? Replying evasively to this question, the author tells us that in every dwelling which a band of geisha occupy there is placed in an alcove the image of a kitten erect, one paw outstretched as if inviting, whence its name,—"The Beckoning Kitten." It is the *genius loci;* it is supposed to bring good fortune, the patronage of the rich, the favor of banquet-givers. They who know, however, the soul of the geisha aver that the semblance of the image is the semblance of herself,—playful and pretty, soft and young, lithe and caressing, and cruel as a devouring fire. It seems also that worse than this may be said of her: that in her shadow treads the God of Poverty, and that the Fox-women are her sisters; that she is the ruin of youth, the waster of fortunes, the destroyer of families; that she knows love only as the source of the follies which are her game, and grows rich upon the substance of men whose graves she has made; that she is the most consummate of pretty hypocrites, the most dangerous of schemers, the most insatiable of mercenaries, the most pitiless of mistresses. Whether all this be true or no, the geisha is undoubt-

edly by profession a creature of prey. She is what she has been made in answer to the foolish human desire for the illusion of love, mixed on the one hand with youth and grace, but, on the other, without regrets or responsibilities; wherefore she has been taught, besides the well-known Japanese game of ken, to play at hearts. To play, however, with a geisha any game more serious than ken is held to be displeasing to the gods.

It appears that the dancing girl begins her career as a slave, a pretty child bought from miserably poor parents under a contract, according to which her services may be claimed by the purchaser for eighteen, twenty, or even thirty-five years. She is fed, clothed, and trained in a house occupied only by geishas, and she passes the rest of her childhood under severe discipline. She is taught etiquette, grace, polite speech; she has daily lessons in dancing; and she is obliged to learn by heart a multitude of songs with their airs. Also she must learn games, the service of bouquets and weddings, and the art of dressing and looking beautiful. Whatever physical gifts she may have are carefully cultivated. Afterwards she is taught to handle musical instruments. At eight or nine years of age she attends banquets, chiefly as a drum-player. We are told that she is then the most charming little creature imaginable, and already knows how to fill your wine-cup exactly full with a single toss of the bottle, and without spilling a drop between two taps of her drum. Thereafter, her discipline becomes more cruel. Her voice may be flexible enough, but lacks the requisite strength. She is made, accordingly, in the iciest hours of winter nights, to ascend to the roof of her dwelling-house, and there to sing and play till the voice dies in her throat. The desired result is an atrocious cold; after a period of hoarse whispering, her voice changes its tone and strengthens. She is now ready to become a public singer and dancer. In this capacity she makes her first appearance at the age of twelve or thirteen. If pretty and skillful, her services will be much in demand, and her time liberally paid for. Then only do her purchasers begin to reimburse themselves for the expense and trouble of her training. For many years more, all that she earns must pass into their hands. She can own nothing, not even her clothes.

At seventeen or eighteen she has made her artistic reputation. She has been at many hundreds of entertainments, and knows by sight all the important personages of her city, the character of each, the history of all. Her life has been chiefly a night life; rarely has she seen the sun rise since she became a dancer. She has learned to drink wine without ever losing her head, and to fast for seven or eight hours without ever feeling the worse. She has had many lovers. To a certain extent, she is free to smile upon whom she pleases; but she has been well taught, above all else, to use her power of charm for her own advantage. She hopes to find somebody able and willing to buy her freedom, which somebody, as the author suggests, will almost certainly thereafter discover many new and excellent meanings in those Buddhist texts that tell about the foolishness of love and the impermanency of all human relationships. At this point of her career Mr. Hearn leaves the geisha, merely noting that thereafter her story is apt to prove unpleasant unless she die young. Should that happen, however, she will have the obsequies of her class, and her memory will be preserved by diverse curious rites.

Follow Me 'Ome.

THERE was no one like 'im, 'orse or foot,
Nor any of the Guns I knew;
An' because it was so, why, o' course 'e
went and died,
Which is just what the best men do.

So it's knock out your pipes an' follow
me!
An' it's finish up your swipes an' follow
me!
Oh! 'ark to the big drum callin',—
Follow me,—follow me 'ome.

'Is mare she neighs the 'ole day long,—
She paws the 'ole night through;
An' she won't take 'er feed 'cause o' waitin' for 'is step,
Which is just what a beast would do.

'Is girl she goes with a bombardier
Before 'er month is through;
An' the banns are up in church, for she's got the beggar 'ooked,
Which is just what a girl would do.

We fought 'bout a dog,—last week it were,—
No more than a round or two;
But I strook 'im cruel 'ard, an' I wish I 'adn't now,
Which is just what a man can't do.

'E was all that I had in the way of a friend,
An' I've 'ad to find one new;
But I'd give any pay and stripe for to get the beggar back,
Which it's just too late for to do.

So it's knock out your pipes an' follow me!
An' it's finish up your swipes an' follow me!
Oh, 'ark to the fifes a' crawlin'!
Follow me,—follow me 'ome.

Take 'im away! 'E's gone where the best men go.
Take 'im away! an' the gun-wheels turnin' slow.
Take 'im away! There's more from the place 'e come.
Take 'im away, with the limber an' the drum.

For it's "three rounds blank" and follow me,
An' it's "Thirteen rank" an' follow me.
Oh, passin' the love o' women,
Follow me,—follow me 'ome.

RUDYARD KIPLING.

FABLES OF FIELD AND STAFF. By James Albert Frye. The Colonial Company, Boston. The reviewer has, so far, merely "sampled" this book, by reading one of its breezy stories of adventures by field and flood, but finds it so full of the spice and humor of army life that he will assuredly not be content till he has absorbed it from cover to cover. The author has been before the public previously, in his similar work, entitled "From Headquarters: Odd Tales picked up in the Volunteer Service," a work which proved so acceptable that he has been encouraged to make his bow to the great world of readers again, and offer a second batch of specimens from his hamper of military recollections and fables. The field upon which he has entered in these volumes is a comparatively new and largely unworked one, and one which abounds with narratives of adventure, of the humor and abandon of army life, and the dashing and genial freedom of a soldier's chat, and of the ways of camps. Those who are on the look-out for bright and original tales, full of snap and spirit, and sure to furnish entertainment for the weariest spirit, cannot do better than purchase this book, and at once sit down and take it in. The stories are brief, well told, and packed full of good things.

REFLECTIONS ON THE ART OF WAR. By Colonel Reginald G. Hart. William Clowes & Son, London. Of all the arts, that of war has been the oldest and most enduring. It began in the earliest days of savagism, when the art consisted in the most skillful handling of club and stone, and it has continued until these latest days of civilization, in which the art has developed into a science than which none is more intricate or fuller of expedients. Step by step the military art has been unfolded, in the double direction of increase in the efficiency of weapons and the effective organization of great bodies of men, until at the present day the nations stand appalled at the proficiency which warlike science has attained, facing each other with immense armies, but afraid to let loose the "dogs of war," lest results of incalculable mischief may ensue.

Under this condition of things a statement of the modern status of the military art is timely and likely to prove of great utility, and Colonel Hart, who occupies the responsible position of Director of Military Education in India, has shown

himself highly capable of the task. His book is brief in scope, but covers the whole field, and is full of illustrations drawn from modern wars, and quotations from the great leaders and students of strategy in recent times.

He seems, however, to ignore the American Civil War in his illustrations, with the single exception of the battle of Fredericksburg, which is frequently cited, while no reference is made to any other action of that war.

The art of war, the author says, is "so many-sided, so susceptible of infinite modifications, according to time, place, and circumstance, and, above all, according to the capacity and temperament of those who conduct it, that fresh contributions to its study may be still permitted," even though treading on "more or less familiar and well-worn ground." Certainly the book needs no apology. It is abundantly worth reading, alike for those familiar and those unfamiliar with military affairs, and can safely be recommended as a timely contribution to the literature of tactics and strategy.

GENERAL HANCOCK. By General Francis A. Walker. D. Appleton & Co., New York. Pennsylvania may justly claim the credit of having contributed in very large proportion to the leading commanders in the Civil War, and particularly of herself furnishing the leaders in the great battle on her own soil, the turning-point in the tide of the war. Meade, the hero of Gettysburg, and Reynolds, the martyr of the same hard-fought field, are two of those who need hardly be named, while Hancock, whose biography forms the most recent volume of the Great Commander series, may be named as a good third. No other State in the Union can present the names of three men of equal prominence in the great war of the western continent.

General Hancock was identified with the Army of the Potomac. His career was that of this army, with which he was present before Richmond, at Antietam, Fredericksburg, Chancellorsville, Gettysburg, and throughout the Wilderness and Petersburg campaigns, until the final scene of surrender, and the muster out of the army that had quelled the Great Rebellion of the nineteenth century. Throughout these four years of untiring warfare he proved himself one of the ablest of division and corps commanders, and the story of his life, as told by General Walker, is in effect the history of the doings of that grand army, which did so much towards wrecking the power of the Confederacy and bringing the colossus of rebellion to its knees. It is not our purpose to give any details of General Hancock's life. Those who would know what claim Hancock has to a place in the Great Commander series may be referred to General Walker's work, which, indeed, is still more a history of the war in Virginia, particularly of the great battles from Fredericksburg to those of the final campaign, than it is a biography of the hero to whom its special attention is paid.

MILITARY ORDER OF THE LOYAL LEGION OF THE UNITED STATES.

Companions of the Loyal Legion are invited to contribute to this department. News of the Commanderies is always welcome, but suggestions likely to inure to the benefit of the whole organization are of higher value, and therefore particularly desired. The pages of the Loyal Legion Department of the "United Service" are always at the service of members of the Order desiring to discuss matters of general interest to their comrades of the Military Order of the Loyal Legion.

California Commandery.

Stated meeting held December 31, 1894.

To THE FIRST CLASS.—Lieutenant George Albion Calhoun, U.S.N.; Lieutenant Lloyd Vinton Nanscawen, U.S.V.; Lieutenant Robert Campbell Van Vliet, U.S.A.

To THE FIRST CLASS (by inheritance).—Wilbur Maurice Swett, Passed-Assistant Surgeon Norman Jerome Blackwood, U.S.N.; Irwin McDowell Hoyt, Mansfield Judah.

To THE SECOND CLASS.—Lloyd Bennett Christy, Volney Randall Cragin, Charles Larkin Davis. Charles Hughes Gordon, Harvey Folsom Gould, Cornelius Bradley Hawley, Walter Maynard Lippincott, Edward William McKim, George Henry Mendell, Jr., Ralph Todd Morgan, Cornelius Cole Smith, Thomas A. Smith, Henry McGuire Taylor, Charles Frederick Waymire, William Norton Wood.

District of Columbia Commandery.

Stated meeting held January 2, 1895.

To THE FIRST CLASS.—First Lieutenant William Warren Bliss, late U.S.V.; Acting Assistant Paymaster John Henry DeMeritt, late U.S.N.; First Lieutenant Charles Henry Evans, late U.S.V.; Captain James Owen O'Neill, late U.S.V.

To THE FIRST CLASS (by inheritance).—William James Rucker.

To THE SECOND CLASS.—Alexander Sweeney Capehart, William Lawrence Scott.

Iowa Commandery.

Stated meeting held January 8, 1895.

To THE FIRST CLASS.—Captain James Samuel Clark, U.S.V.; Lieutenant Elias Babbitt Woodruff, U.S.V.; Major Julius Monroe Jones, U.S.V.

Indiana Commandery.

Stated meeting held December 19, 1894.

To THE FIRST CLASS.—Captain James Bragg, U.S.V.; Captain Byron K. Elliott, U.S.V.; Colonel Samuel F. Gray, U.S.V.; Lieutenant James R. Henry, U.S.V.; Lieutenant Louis Kern, U.S.V.; Lieutenant William R. McMahon, U.S.V.; Captain William R. Myers, U.S.V.; Colonel Milton Peden, U.S.V.

Vermont Commandery.

Stated meeting held January 8, 1895.

To THE FIRST CLASS.—Lieutenant Willis Walker Morton, U.S.V.

To THE FIRST CLASS (by inheritance).—John Francis Mead.

To THE SECOND CLASS.—Joseph Benjamin Eldredge.

TRANSFERS.

Massachusetts Commandery.

Colonel George W. Baird, U.S.A., to Illinois Commandery.

California Commandery.

Admiral **John Salathiel Skerrett**, U.S.N., and Chief Engineer **Montgomery Fletcher**, U.S.N., to District of Columbia Commandery.

District of Columbia Commandery.

Dr. **John Brown Hamilton** to Illinois Commandery.

Illinois Commandery.

Colonel **Samuel Walter Reynolds** to Missouri Commandery, and Lieutenant Colonel **Henry Egbert** and Captain **Joseph Dever Fegan** to Iowa Commandery.

Ohio Commandery.

Captain **Stephen Randall Stafford**, Captain **William Somerville**, **Albert Harlan Bates** to Illinois Commandery; General **Benjamin Harrison** and Colonel **Ruel M. Johnson** to Indiana Commandery.

Minnesota Commandery.

Major **Lloyd Wheaton**, U.S.A., to Kansas Commandery and Colonel **Chas. Bentoni**, U.S.A., to California Commandery.

Nebraska Commandery.

Lieutenant **John Thomas Bell**, U.S.V., and Captain **James Squire France**, U.S., to California Commandery.

NECROLOGY.

California Commandery.

Lieutenant **Frank H. Swett**, November 5, 1894, at Spokane, Washington.

Minnesota Commandery.

Colonel **James Gilfillan**, December 6, 1894, at St. Paul, Minn.

Pennsylvania Commandery.

Captain **John Taylor**, U.S.V., January 5, 1895, at Philadelphia, Pa.

MISCELLANEOUS.

REPORT OF MINNESOTA COMMANDERY JANUARY 1, 1895.

Total membership since date of organization, June 5, 1885:		
Charter members	20	
Elected to this Commandery	324	
Transferred from other Commanderies	49	
		393
Loss:		
Transferred	43	
Died	37	
Dropped	2	
		82
Present membership		311

I. The following is promulgated for the information of the Order:

Journal of the Tenth Annual Meeting of the Commandery-in-Chief, October 10, 1894:

Extracts: . . .

Companion GEORGE H. SHARPE, New York, submitted the following:

Resolved, That the Commandery-in-Chief call the attention of the Commanderies of the Loyal Legion to the fact that there is a recognized method of attaching the ribbon to the badge of the Order, and that any other attachment is irregular, unauthorized, and calculated to bring the insignia into disrepute from want of uniformity.

That the Commander-in-Chief is requested to formulate a regulation in conformity herewith for publication in the circulars of the several Commanderies, and that the recorders publish such regulation in the circulars of the Commanderies.

After discussion,

The question being upon the adoption of the resolution,

It was unanimously adopted. . . .

II. In conformity with the resolution the Commander-in-Chief directs attention to the constitution of the Order (1889), *v.* page 34, showing the insignia as worn with a concealed pin.

By command of

Brig.-Gen. LUCIUS FAIRCHILD, U.S.V.,
Commander-in-Chief.

JOHN P. NICHOLSON,
Brevet Lieutenant-Colonel, U.S.V.,
Recorder-in-Chief.